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MIND AND ITS PLACE IN NATURE

By the Same Author

THE PROBLEM OF THINGS IN THEMSELVES

PROBLEMS OF CONDUCT

PROBLEMS OF RELIGION

SHALL WE STAND BY THE CHURCH?

AMERICA FACES THE FUTURE

ESSAYS IN CRITICAL REALISM (*With Six Other Authors*)

MIND AND ITS PLACE IN NATURE

BY

DURANT DRAKE

PROFESSOR OF PHILOSOPHY AT VASSAR COLLEGE

New York

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NOTE

This book was projected, and its title chosen, during the Christmas holidays of 1923-24. After it was completed and sent to the publisher, in the Spring of 1925, I learned that Mr. C. D. Broad was about to publish a book with an almost identical title. I at once wrote to him, pointing out the coincidence—which he suggested might be due to unconscious reminiscence in both our minds of the title of a well-known essay of Huxley's. Neither he nor I nor any of those with whom I have raised the question sees any objection to the appearance of two volumes on opposite sides of the ocean in the same year bearing an almost identical title, and dealing with the same subject. So I have left the title as I originally phrased it.

Mr. Broad's book reached me while I was reading the proofs of this volume, and I have added a few foot-notes referring to it. It is, in my judgment, the best product to date of British thought on this problem. But in spite of its logical acumen and painstaking, honest analysis, its conclusions seem to me lacking in coherence. They cry out for correlation by the theory which I here propound.

PREFACE

This volume contains a theory of the ultimate nature of mind and matter. The theory is a thoroughgoing realism, taking the knowledge composing the physical sciences as literally true of an existing world, and asserting an equally objective reality for minds. It holds that *in so far as perception and conception are correct,* the data of our experience are the very physical things that surround us in space; and, similarly, that *in so far as introspection is veridical,* its data are the very events that make up our mental life.

Such a view will at once be contrasted by the reader with the types of realism now most in vogue; for example, with the views of Messrs. Bertrand Russell, Whitehead, Broad, and the American "neo-realists." These thinkers usually assume that *all* sense-data are existents, for which a place must be found in some space external to the body of the perceiver. They differ widely in their conception of the nature of mind, and in their conception of the nature of the relation between sensa and the atoms and electrons of science. These are usually the weakest points in their doctrine. But I wish to meet them on their own chosen ground, and to dispute their theory that sensa are necessarily ex-

istent because "given" in experience—or, in other words, because we are aware of them.

I propose, for the sake of making sharp the contrast between the sort of realism I am defending and the realism of these contemporary writers, to adopt a term already in use and call their view *pan-objectivism*. It is, at first sight, perhaps the most plausible doctrine. But if it is true, the world is a quite extraordinarily chaotic world. The painstaking and admirable analysis which has been carried through on the basis of the pan-objectivist assumption, by the thinkers referred to, and others, has led, with relentless inevitability, to world-views far removed from that of common-sense and everyday science. Some of these doctrines conceive the world to contain innumerable different qualities superposed at the same point in space and time. Other forms of the theory suppose the world to contain innumerable private spatio-temporal realms. The more completely the facts are taken into account, the more confused and unintelligible the world becomes. It seems timely, therefore, to question again whether the fundamental assumption of this pan-objectivist realism may not be mistaken.

The view developed in this volume holds that our sense-data are not necessarily existent because "given" in experience, but are existent only in certain cases, or in certain of their aspects. How this illusory element in experience arises, and *what* exists when illusion takes place, are questions re-

quiring careful answer. But, as the argument will show, there are answers which restore to us the relatively simple world that common-sense and science naturally believe in.

The initial step is, indeed, hard to take. It is difficult to persuade most men that qualities which they seem to see in things may not really be there. Just so it was difficult, not so long ago, to persuade men that the earth is revolving and that the sun does not really circle round it daily. The Copernican theory makes as sharply against the *look* of things as the theory here offered of the status of sense-data. But the Copernican theory has been universally accepted, because of the simplification which it brings into our conception of the solar system. It would have been possible to elaborate the Ptolemaic theory, piling epicycle upon epicycle, and rendering it consonant with every new observation. Similarly, it will be possible, perhaps, for the pan-objectivists to elaborate their confused and multiple world until there is no known fact that is not somehow fitted in. But in my opinion this is largely wasted work, because it proceeds upon a premise which, though at first sight the most plausible, renders impossible an understanding of the actual world-order. It is astonishing how many tangles are cleared up by the adoption of the contrary hypothesis here developed, how many problems turn out to be gratuitous. Whether true or not, this is certainly the simplest hypothesis which covers all the perplexing facts of physical and mental exist-

ence. Surely, then, it deserves as careful elaboration as has been given to the pan-objectivist view. I plead for the attention of realists to this alternative hypothesis.

A theory is not proved true because it is simple and in accord with common-sense. But it is surely a great relief to be able to hold to the single spatio-temporal order in which we all naturally believe, to get rid of all "interpenetration," to return to the doctrine that there is one existent only at any one point of time and space.

Moreover, the theory here offered has a place for mind in nature, without explaining it away as merely a form of behavior describable by physical science, or merely a relation between sensa and an organic body. It makes minds a really intelligible part of nature, and explains their origin in a world that is, for the most part, non-mental. Of course, on any hypothesis, there could be a history of the world, which would show when, and under what conditions, minds appear. But this appearance is, for dualistic theories, a sheer marvel, unpredictable, incomprehensible. Only on some such view as is here presented can we understand *how* mind, with its function of consciousness, naturally and inevitably develops in an organism with sense-organs and brain in the midst of a physical world. There is no mysterious interaction of alien realms, no dualism either of substance or of causal laws. Mind and matter belong to the same realm, and it is possible to see *how*

matter affects mind and mind matter without postulating any fundamentally new laws of behavior for the underlying units.

It is also possible to see in what sense knowledge is transcendent, and how this sort of transcendence is compatible with the common-sense idea that every existent remains in its own place in the spatio-temporal order. It is not necessary to accept knowledge as an unintelligible and ultimate fact, any more than it is necessary to accept mind as an ultimate and inexplicable reality. When Mr. Whitehead, one of our ablest contemporary realists, says, "knowledge is ultimate" (*The Concept of Nature,* p. 32), I reply by quoting another sentence from the same book (p. 98), "The systematizing intellect abhors bare facts."

This view, then, I like to call *monistic realism,* because it assumes but one universal substance, and a single spatio-temporal order of relations between the units of this substance. And yet it has room for all the facts of physics and psychology; it puts all existence, physical and mental, into this one homogeneous world-order. Thus it seems to me to explain more simply and comprehensively than any other theory the observed peculiarities of experience. And that is surely a good reason for holding it to be true.

On the epistemological side the view is what some of us have lately called "critical realism." That doctrine is restated in the opening chapters of this volume, with, I hope, some improvements due to

further thought and the comments of various critics. The epistemological discussion is made as brief as possible, however, in order that the bulk of the volume may be devoted to a study of the nature of mind. The metaphysical conclusions reached greatly strengthen, in my opinion, the epistemological view defended in the co-operative volume, *Essays in Critical Realism.*

A metaphysical view on these lines has been gradually forming in my mind for twenty-five years. My first attempt to formulate it in print was a monograph entitled *The Problem of Things in Themselves,* published in 1911. I therein acknowledged the principal intellectual debts of which I was then conscious. In subsequent years I printed a number of articles in the *Journal of Philosophy,* the *Philosophical Review,* and *Mind,* some of the substance of which is incorporated in this volume.

In 1917 I persuaded six contemporary realists to join with me in writing a co-operative volume, which was presently christened *Essays in Critical Realism.* My discussions with these collaborators, which continued for three years before the publication of that volume, were of great service to me. Discussions with several of the authors of *The New Realism* have likewise been helpful. Mr. George Santayana has influenced my thought profoundly ever since my student days; and to Mr. Dickinson Miller I owe an equally long-standing debt. To several living psychologists also I owe much, in particular to Professor Margaret Floy Washburn, whose *Movement*

and Mental Imagery gives an excellent exposition of the "motor" theory of consciousness, which has become fundamental in my thought. Miss Washburn has been kind enough to read this book in manuscript, and I am grateful to her for various helpful suggestions.

But the most important help toward the writing of this book has come from Mr. C. A. Strong, with whom I have had the privilege of correspondence and conversations for a dozen years. It was, indeed, begun in response to his urging, and has been discussed with him in detail. Some of the most important links in my argument were first clearly formulated by his fertile and acute mind. We have been feeling our way toward a doctrine somewhat different from that expressed either in his early writings, or in my papers above referred to. Although often temporarily disagreeing, we have emerged into a practically complete agreement. And although the work here is all my own, Mr. Strong authorizes me to say that it represents his present view, to all intents and purposes, as well as my own. I confidently expect that future papers from his pen will strengthen the arguments for the truth of the doctrine. It is not often that two students of philosophy, nurtured in different environments, find themselves able so completely to agree. But indeed, the arguments for the view, as we now have worked it out, seem to us overwhelming.

Nevertheless, it is safe to expect that many readers

will misunderstand my exposition, either because of the incurable ambiguity of the terms I must use, or because their own preconceptions color the comprehension of my meaning. Nothing is more difficult than to wrench a reader's mind away from habits of thought that have become deep-rooted. And the point of view here urged really is new to the world of thought, new, that is, in its wholeness. Many of the arguments and illustrations used are familiar, perhaps tediously familiar. But I am persuaded that many of these really do prove something, and that it is worth while to harp upon them until their significance is grasped. The earlier thinkers who used them were on the right track, though they were unable to see their way through to a convincing conclusion. I pray the reader, therefore, not to suppose that I am defending an outworn theory, but to try to see exactly what the conclusion is to which by these arguments, old and new, I am trying to lead him.

I suspect that the earlier chapters, taken by themselves, will seem unconvincing to many readers. I have not been able to devise an order of exposition which would free me from the necessity of postponing to later chapters explanations that would strengthen the earlier argument. The theory is organic; the pieces fit together. I hope, therefore, that the reader who ventures upon the perusal of what, even when put in its simplest terms, is subtle and difficult, will have courage to follow my argument to the end and endeavor to grasp the view as

a whole. For a few such readers, at least, the moment will come when the pieces will fall together into a pattern, and the fundamental simplicity and comprehensiveness of the theory will be revealed.

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MIND AND ITS PLACE IN NATURE

PART ONE—NATURE

MIND AND ITS PLACE IN NATURE

CHAPTER I

THE THREE CATEGORIES IN COGNITION

Philosophers have been trying very hard lately to devise a successful formulation of realism, and of a non-representative realism. Most contemporary thinking is proceeding on the assumption that physical things exist, and that we are directly aware of them, rather than of a screen of "ideas" between us and things. This is a return to the point of view of the natural man, which had been rejected by the subjectivisms, representationisms, and absolutisms of the eighteenth and nineteenth centuries. Human beings, like other animals, are instinctively realists; indeed, in practical life as contrasted with sophisticated philosophizing, they are inevitably realists. This does not prove that realism is true. But if a realistic theory, when worked out in detail, can be made to fit the facts of experience, it has a great advantage in plausibility over a more artificial and unnatural doctrine.[1]

Never yet, however, has such a theory been *made* to fit the facts of experience. That the truth lies in a combination of "epistemological monism and real-

[1] Even some who call themselves, for other reasons, "idealists" are accepting the realistic view, e.g., Professor Norman Kemp Smith, in his *Prolegomena to an Idealist Theory of Knowledge*, London, 1924.

ism'' was the main contention of the co-operative volume *The New Realism;* and this view has been defended by other able writers, American and European. It is held at present, however, by the best of the British thinkers only in a drastically modified and distinctly ''Pickwickian'' sense. What we are directly aware of is, for them, not physical *things*, but merely *sensa*. The combination of epistemological monism and realism has proved harder and harder to defend, as its implications have been more and more clearly discerned. I believe that this view *can* be reasonably maintained only on the basis of the theory here to be presented.

The belief in realism will be defended in Chapter III. But before attempting the justification of realism, it will be well to consider what realism, when clearly scrutinized, implies. Its fundamental tenet is that things exist in their own right, prior to and independently of our knowledge of them. Experience reveals but does not create them. This need not be taken to imply, however, that experience is completely veridical. Obviously, our experience does not reveal to us existing things in their entirety, but only reveals certain features of them—those features, in general, which it is useful to us as human beings to know. And, on the other hand, there are many features of the data of our experience which reflection makes it very difficult, to say the least, to regard as features of the existing things which we are cognizing, or in any sense features of the real world about us.

This will be clear if we take the case of hallucination, or the case of imagining or dreaming of a non-existent object. When suffering from an hallucination I may see a red dragon in front of me. Or, more normally, I may vividly imagine it there. Or I may see it there in a dream. There is really no dragon there, or, probably, anywhere else in the existent world. Yet "a dragon standing there" is, in each of these supposed cases, my "datum," the object "given" to me at the moment, what is "before my mind," the "content" of my experience, that of which I am conscious, or aware.[1]

These cases illustrate the common-sense view, that even our sense-data (those data which appear to be physical things) are not always really existing things. The point can also be illustrated by the case of mirror-images. When looking through a mirror, we have visual data which the plain man does not believe to exist in that part of the physi-

[1] These expressions are used as equivalent. It will be seen that the term "datum," as here used, is of wider application than the pan-objectivists' term "sensum." My persistent use of this more inclusive term is based upon my conviction that the problem of consciousness is essentially the same in the cases of perception, memory, conception, etc. Epistemology has suffered from too exclusive attention to the case of perception. The epistemological status of a sensum and of a datum of memory or conception is essentially the same. A sensum does not necessarily *exist* anywhere because it is sensed, just as truly as a datum of conception need not exist because it is conceived. In fact, there is no sharp line between sensa and other data of consciousness, as will be shown in the text. The problem of the existential status of sensa suffers from isolation from the larger problem of the existential status of the data of consciousness in general. And if I give most of my space to discussing perception, it is to meet the pan-objectivists on their own ground.

cal world where we seem to see them, or indeed (so far, at least, as their reversed shape is concerned) to exist in any part of the physical world. The appearance to consciousness of an object, then—in other words, the fact that we have the object as a datum of consciousness—does not, to common-sense, guarantee the *existence* of the object, anywhere in the real world. If the dragon actually exists, he really belches flames, he really devours real people—or does whatever a real dragon would do. This status, existence, is a status of a very different order and importance (to the people who might be devoured, for example) from the status of being a datum of my experience.

Some pan-objectivists (realists who believe that *all* our sense-data have objective existence, out in the world where they seem to be) will say that my datum in the supposed cases would not, strictly, be "a dragon", but merely be a patch of extended color that I *call* a dragon; and that that patch of color *does* have actual outer existence. This, however, is not the view of common-sense. And I believe it to be erroneous in both its contentions, as the following chapters will maintain. The color and shape sensed are not a bit more actual than the bulk, the *aliveness*, the sinister intent—or whatever other characters of dragonness confront me. And, whether or not all these characters are in the same boat existentially, certainly they are all characters of what is before my mind. What I am conscious of is *not* merely a patch of color, it is a *dragon*.

And now, if it is true that even sense-data—data that have the appearance of physical things seen, or otherwise cognized—*may* be hallucinatory or illusory data, whose supposed existence is, in part or *in toto,* a mere false imputation, it is still more obviously true that when we seem to remember an experience that we never actually had, or believe in a supposed historical event that never happened, or think of such a pure ideal as "the perfect man," our datum, the object that is before our minds, does not exist. For that matter, I may definitely have as my datum "a non-existent object." It should be perfectly clear, then, that the class of the data of consciousness is one class of entities, the class of existents is another. In cases of veridical cognition these two classes overlap; in such cases what is before my mind (my "datum") is identical with what exists—*i.e.*, with the particular existent to which the organism is reacting at the moment. But whenever we are *not* cognizing existents, and just in so far as our cognition of existents is *not* accurate, what is before our minds does *not* fall within the class of existents.[1]

Thus in all cognitive situations there is an ele-

[1] This was the main contention of *Essays in Critical Realism.* In Mr. Broad's *The Mind and its Place in Nature* he has made what I take to be exactly our point, by saying that while there is, in all cognitive states, an Epistemological Object, there is not always a corresponding Ontological Object. He apparently holds, as I do, that the epistemological object (the datum, in my terminology) does not necessarily exist. But he holds that there is always, in cognitive states, an "objective constituent" (the sensum) that does exist. It is here, it seems to me, that his analysis is faulty—as I shall presently indicate.

ment of certainty and an element of uncertainty. It is certain that just such and such an entity is "given"—in other words, that someone is conscious of just such and such an object or event. It is uncertain that such an object really exists, or that such an event really happened. In *Essays in Critical Realism* we distinguished these two aspects of the situation by saying that the awareness (or intuition) is certain, the affirmation of existence uncertain. That this particular entity is "given" (is my datum) is indubitable, at the moment. But faith in its existence is something more. If our faith, our affirmation, is justified, we are not only intuiting data, we are cognizing reality. Genuine perception is veridical cognition. It involves something more than consciousness. There must be, in addition, a coincidence, or relation of identity, between the datum of perception and an independently existing thing.[1]

[1] Mr. Broad criticizes this doctrine, as formulated in *Essays in Critical Realism*, as not having room for knowledge of particulars (*Proceedings of the Aristotelian Society*, Supplementary volume No. 4 (1923), p. 114). But of course what I am aware of may be a particular. That particular is, then, my "datum," the essence "given" to me. The term "essence" should not be contrasted with the particular, or the concrete, or indeed with anything. The class of essences is the inclusive class, covering anything that can be mentioned. An essence is "a describable somewhat." In Mr. Broad's illustration, the perceiving of two similar red spots in different places simultaneously, my datum would be "Two red spots, one here, one there"—or something of the sort. If I perceived them successively, my data would be, perhaps, "This red spot," and then "This other red spot to the right of the first one."

We are, indeed, aware of particulars, and of actually existing particulars. At least, as realists we believe and affirm that we are. But by being existents these objects of our experience do not cease

In short, the point which I am making, and which it is essential to grasp if the epistemological tangle is ever to be unravelled, is that the datum of consciousness *as such* does not exist; the status of being a datum, of being "given," is not an existential status. Consciousness does not confer existence upon its objects; they are merely essences, objects of discourse, except as they may happen to have existence independently of any one's awareness of them.

Now those forms of realism which we may group together under the name "pan-objectivism" attempt to give to *all* the data of our perceptual experience, even of hallucinations and illusions, an existential status, to find room for them out there in space where they seem to exist.[1] That attempt, which leads to extremely complicated theorizing, is abandoned in this volume as a false trail. It is asserted, on the contrary, that the data of our experience exist *only in so far as we are cognizing existents and our knowledge is veridical.* The analysis of cognition, then, requires three categories: first, the knower, or self (to be studied later); secondly, the object known (the "objective" of the knowledge relation, to use a word of Mr. Russell's); thirdly, the datum of experience, (the object-as-known, that of which we are aware, what

to be data, given essences, counters for discourse, logical entities. *That* they are anyway.

[1] Or, as in the case of Mr. Broad, they hold that there is an "objective constituent" in the experience which exists out there where it seems to exist.

is present to consciousness). Sometimes, in differing degrees, but not always, the entities coming under the second and third categories are identical. But since that is a matter for investigation in each case, the three categories are always necessary for clear thinking.[1]

It may be said that we need also the category of "consciousness," or "awareness;" that in sense-experience, for example, we need the category of "sensing." But it is one of the contentions of this volume that consciousness, or awareness, in all its phases, is not an ultimate, unanalyzable thing, but is a complex event, which can be analyzed into simple events occurring in different places in a single spatio-temporal order, and the relations between these events. We shall attempt to describe this complex situation later. But nothing can be made clear until the distinction is thoroughly grasped between datum of consciousness and thing known.

The term "datum" is applicable only in a situation where there is consciousness. There are doubtless (though I do not care to defend the assertion) moments of blind animal feeling in our lives, when

[1] It may be asked, is such an identity of datum and object-known an "existential identity," or merely a "logical identity?" The question betrays a misapprehension of the situation. Give up the notion that being-a-datum-of-consciousness is *ipso facto* being an existent, and there is no bar to complete identity of what is present to consciousness and what exists. It is not that there is a relation of similarity between the two; there are not two existents to be similar. Cognition lights, as it were, upon the very thing or property that exists.

no objects of any sort are "before the mind." For such self-contained, anoetic events, unreferred, unnoticed, mere throbs of being, the term "data" would be inappropriate.

But however this may be, whenever we are conscious *of* anything, what we are conscious of may be called our "datum." In cases where what we are conscious of is not an existing thing we need only the two categories, "knower" and "datum," to describe the situation. Of course, any datum may itself be made the objective of the knowledge relation; we may seek to have exact knowledge of our hallucinations, dreams, or fancies. In such a case a new datum appears, my idea of my hallucination, dream, or fancy; and we again need all three categories. But when I simply *have* an hallucination or dream or play of fancy, only two categories are necessary, unless it is desirable to call attention to the non-existence of an object of the sort present to consciousness, or unless it is desirable to contrast what is seen, or otherwise apprehended, as at a certain place with the something else that actually exists in that place.

But whether or not we shall find it convenient to use three categories in such cases, we clearly need all three in the ordinary cases of consciousness of the world about us—under which I mean to include consciousness of our bodies. For error (or illusion) is not an abnormal occurrence; on the contrary, perception usually has its elements of illusion. In other words, most of our ordinary per-

ceptual data have features which are not characteristics possessed by the things perceived.

That this is so in many cases, common-sense will admit. In the familiar example of the oar projecting out of water, the physical oar is straight, while my visual datum may be "a bent oar." Even in this case, my datum may coincide in several respects with the existent thing; it may be veridical with respect to the relative size of the oar, its shape (apart from the bentness), its position among surrounding things, and its distance from my body. But since the bentness, which is one of the characters of my perceptual datum, cannot be ascribed to the oar itself, the "datum" and the "physical thing" remain separate categories.[1]

[1] The question as to what *is* given to a perceiver is not easy for an onlooker to answer; he has to judge by seeing how the perceiver acts; and much of the reaction of the perceiver is hidden from the onlooker. It is not always easy even for the perceiver himself to answer. A man looking at a penny from the side would, in most cases, merely be conscious of "a penny looked at from the side," and not of "an elliptical image." But if he lapses from the perceptive attitude, and recovers the "innocence of the eye," he may become conscious of "an elliptical image." He cannot, I think, be conscious of both essences at the same time, for the two states of awareness are based upon conflicting motor responses. But he can alternate rapidly between the two states of consciousness, having one datum and then the other in rapid succession.

I believe, then, that Mr. Broad is in error in speaking of the elliptical patch of color as the "objective constituent" of the *perceptual* situation. It is, rather, the "epistemological object" of *another* situation, the "inspective" situation. What *exists* in both cases is, on the one hand, the penny, and, on the other, sensory states in the perceiver's head, initiating first one bodily adjustment and then another. The assumption (*vid. The Mind, etc.*, pp. 297-299) that the epistemological object is brought before the mind by the existence of a sensum—the fallacy that, as it seems to me, vitiates Mr. Broad's and Mr. Russell's thinking—is a very natural one. But

But even in the most ordinary perception, it is a commonplace that the character of perceptual data is in large measure a function of the sense-organs and the brain of the knower, as well as of his position in space and the nature of the intervening media; it is even, in considerable degree, a function of his past history. Is it possible, in the light of these facts, to identify perceptual data with existent things known, not only in the respects in which we may readily believe them to coincide, but in *all* respects? Only, so far as I can see, on one of two hypotheses. We might hold that the factors above-mentioned, however they may vary, never cause any data to appear that were not, all the time, characteristics of the existent thing perceived. Or we might hold that the process conditioning perception is not merely, what it appears to be, a process of causal influence coming from the physical thing

it is made unnecessary by the theory here to be developed. The datum-of-inspection, "an elliptical patch of color," is always *potentially* present to consciousness when the perceptual datum "a penny looked at sidewise" is present, because a slightly altered bodily reaction will cause awareness of it.

Similarly, a man looking at the oar protruding from the water may be aware merely of "this oar," or of "a bent oar," or of "an oar that looks bent but is straight." A man noticing the visual image for the first time would, doubtless, for the moment, have the datum "a bent oar"; then, by a quick correction, his datum would become "an oar that looks bent but is straight." An experienced person, interested in using the oar for rowing, would probably not notice the bent look it presented, and be aware only of "this oar," without reference to straightness or bentness.

Certainly, the straightness, hardness, weight, etc., of the oar can be "given" as truly as its color. The physiological process conditioning the awareness will be different in the different cases. But that is another matter.

perceived to the perceiver, but also a return-process, causing the characteristics of the perceptual datum which are determined by the nature of the perceiving organism to get out into the thing perceived during the moments of perception.

The first hypothesis, when thoughtfully examined, surely strains credulity too far. It implies that the things we perceive contain in themselves all the infinitely varying characteristics of the perceptual data of all their real or possible knowers. For example, I, with normal vision, see an apple as red; my neighbor, who is red-blind, sees it as gray; another, having taken santonin, sees it yellowish; a fourth, looking through blue glasses, sees it bluish. If we had a wide enough pharmacopeia, we could doubtless, by proper internal dosage, make ourselves see it of any hue we chose. Or if we had eyes differently constructed, or if we looked through glasses of different colors, we could see it of any color. It is quite likely that the colors of which some other animals are aware when they look at an apple are quite different from the colors of which we are aware. If we are to hold consistently to the hypothesis under discussion, we must assert that all the colors that could be seen under any circumstances by any living creature in that apple exist simultaneously in the apple, whether or not any one ever does perceive them.[1]

[1] Of course there are many possible variations of the hypothesis. We may hold that all these colors (sensa) exist where they are, or might be, seen, and that a physical "thing" is merely the "class"

In every one of these cases there are physical differences, in the eyes, or brain, or in the glasses worn, that account for the differences in the data that appear to the various perceivers supposed. The difficulty does not lie in accounting for the differences, it lies in supposing that all these different characteristics exist *in or as a property of the physical thing looked at, or in the part of external space toward which the eyes are focused.* Each of the observers is affected by identically the same events in the apple—*viz.,* by certain oscillations in the electronic motions within the atomic structure of the apple. These oscillations radiate ether-vibrations which strike the eyes of the various observers, all of these vibrations being of the same rate. The *differences* do not appear until these vibrations reach the eyes, or glasses, or some distorting medium. It certainly looks to common-sense as if the different color-qualities were produced *at or near the perceivers' end of the process,* instead of co-existing all the time in the apple, or in its neighborhood.

Moreover, the pan-objectivist view compels us to give up our belief in what Mr. Montague has called the "uniplicity" of physical things. Common-sense and natural science regard physical existents as having a definite and very limited set of properties, rather than as being a hodge-podge of innumerable

of these and all other (*e.g.* tactual) sensa that we call its qualities. This I understand to be Mr. Russell's view. But all these variations of the hypothesis under discussion fall within the scope of the criticisms offered.

qualities superposed at the same points, or as being a "class" of innumerable "sensa" existing in innumerable separate spaces. These latter views are not refutable; no metaphysical view is refutable; we are in a region where not proof and refutation are possible, but only comparative plausibility. But we should see clearly that the various brands of pan-objectivism are obliged to construct worlds vastly more complex and confused than the world we naturally believe in. If all sense-data really exist somewhere "out there," physical things must be mere "constructs" or "limits," useful tools of thought, but not existents; or else every "physical thing" is a "class" of innumerable "sensa" occupying innumerable positions or spaces. Or something of the sort. Our supposedly single coherent spatio-temporal order is replaced by a world of multitudinous superposed qualities, or of multitudinous space-times. Surely, before accepting such bewildering and upsetting conclusions, we should consider carefully the alternative view to be unfolded in this volume, which retains the coherent universe of common-sense and science.

The difficulty lies not merely in believing the world to be so extraordinarily manifold, but partly in believing that a physical thing has innumerable qualities *so nearly alike and yet different.* If a thousand people look at the apple, from their different points of view, and note their respective sense-data in detail, it will be clear that each of the thousand data varies slightly from all the others. A

million observers, of various animal species, would carry the variations so much the farther. Each of these million data has, apparently, as good a right as any other to be considered a part or aspect of the physical apple. But then the physical apple is a mere blur. This seems, indeed, logically possible while one is discussing epistemology. But can any one who has watched an apple growing in his orchard, and thought of it as a living thing, formed out of earth and water and air, really believe such a doctrine?

The alternative pan-objectivist hypothesis, which considers the data of perception as projected into outer space, *put* there rather than *found* there, by the act of perception, seems somewhat less grotesque. Manifold as the object becomes when many observers simultaneously perceive it, it may at least be relatively simple and definite when no one is looking at it. This view implies that the process conditioning perception is not merely the one-way process that we have discovered, bringing influences from the outer world to organisms, but a double process, throwing back into the physical thing, or into some realm of outer space, the qualities which the earlier part of the process has brought into being. Mr. Whitehead speaks, for example, of the "ingression into nature" of "the delusive sense-object" (*The Concept of Nature,* p. 156). Such a theory allows us to hold that the data of perception are really "out there" at the moment of perception,

although they were not there a moment before, and will not be there when our eyes are closed or our backs are turned.

Upon this view the extraordinary multiplicity of variations in quality would be possessed by the physical thing only when and so long as a great many observers were simultaneously observing it. But, though this saves a great deal of the trouble we have been noting, it leaves enough to be very disturbing. And there are two remarks of a different nature to be made upon this theory. First, no such return-process is known; and it is extremely difficult even to conceive, concretely, what sort of a process it can be. Many of the causal factors involved in the determination of what is to be "given" to the perceiver are at the organism's end of the perceptual process. Yet, if this theory is true, the datum produced must somehow get out into the place from which the process started (or into some corresponding spatial region, if you believe in multiple spaces). In spite of the painstaking and elaborate theorizing of contemporary realists, I have not found this problem even clearly stated, much less solved. The outgoing process which, on the theory, must be assumed in perception remains utterly mysterious, undescribed, unexplained, out of line with everything of which physics and psychology tell us.[1]

[1] Mr. D. C. Macintosh, in his *Problem of Knowledge*, postulates a "spiritual creative activity" of the mind, or soul, which puts the sense-qualities upon physical things during the moments of perception. This seems to me a merely verbal, and magical, solution of the

The difficulty may be more clearly realized if we take a concrete illustration. For example, when I look through blue glasses, my sensa are of various shades of blue. How did the "blue" get out there at the moment when I put my glasses on? *Has* any change taken place *"out there?"* If simultaneously you put on red glasses, does the "red" come into existence out there also, at the same moment? Similarly, when you and I open our eyes, unspectacled, and look at the object, do the shades of color that we respectively see come into existence *out there?* If in either case it is admitted that the color is *not* out there in the space toward which the eyes are focused, pan-objectivism is given up. The fact that a sense-quality *seems* to be out there is no longer taken as evidence that it *is* out there; and the way is open for our alternative theory.

The other remark to be made is that if the qualities of our data are thrown into the physical thing by our act of perceiving, our perceiving them there is not knowing the thing as it is in itself, prior to our perception of it, but only as we make it in the moment of our perception. So we should still have our third category on our hands—the datum, which is the object-for-us, the thing as it appears to us when and because we look at it, in addition to the thing-as-it-is-in-itself, independently of our knowl-

problem. No evidence of the existence of such a mysterious and unintelligible activity is offered, no explanation of *how* it accomplishes its end. It is merely a phrase offered to fill a gap in our knowledge. That gap the theory presented in this volume undertakes in outline to fill.

edge of it. And both of these categories, for the pan-objectivists, would represent *existents,* which somehow must be fitted together in one universe. If we give up the latter category (the thing-as-it-is-in-itself), and think of the thing as composed only of (or as "the class of") the sensa which observers actually have, we give up realism and become "subjectivists", or "radical empiricists," *i.e.,* believers in the existence of experience, or the data of experience, only. Against such views I shall argue in Chapter III.

On *either* of the alternative hypotheses of pan-objectivism which have been discussed, various further embarrassing questions can be asked. For example, if all these multitudinous and mutually incompatible sensa are really out there in space, either enduringly or just during the moments of perception, why are they not taken as there by science? Why do scientists universally suppose that physical things have relatively simple and coherent properties? Why are these innumerable sensa not a part of the causal order of nature? Do they affect *the life of the thing* in any way? Has the life-history of the apple, as an apple growing on a stem, been affected by the innumerable color-qualities that various observers have seen, or might have seen, in it at various times? If not, why not? This is worth insisting upon, because pan-objectivism is in its essence an anthropocentric view, almost as much so as subjectivism—or "radical empiricism,"

or "the philosophy of pure experience," or whatever we are to call the view that experience, or experienced objects, are the only reality. Although it gives a concrete and independent existence to things, as these other philosophies do not, it is always thinking of them in terms of our sense-data, rather than in terms of the life that things have on their own account.

Another question is, How is perceptual error possible on a pan-objectivist theory? Error with respect to our perception of physical things consists, as ordinarily understood, in having among our perceptual data features which the things themselves do not actually possess. But the essence of pan-objectivism is to ascribe outer, spatial, reality to *all* our sense-data. It is impossible, then, to be in error, so far as perception itself goes. We could, indeed, err if we were to suppose that these things had under other circumstances the qualities which they have under existing circumstances. But this is certainly far less than the common-sense view of error.

These are a few of the more or less familiar difficulties which we get into when we attempt to ascribe external existence to *all* the data of perception. It seems to me that these difficulties have never been satisfactorily overcome, and that they are so formidable that the view to be developed in this volume, which escapes them, is far more plausible.

CHAPTER II

THE STATUS OF THE DATA OF EXPERIENCE

We have considered some of the difficulties that pan-objectivism involves. The theory to be developed in this volume gives up the notion that our perceptual data are *ipso facto* aspects or features of the things perceived; or, to put it another way, that existing things have necessarily the characters of our very various sense-data. It breaks definitely with that primitive illusion which supposes that we simply look out through our eyes and see existent entities as they are. Our perceptual data are not simply the things about us, entering the field of our awareness, as naïve realism assumes, or "sensa" existing in outer space, as the sophisticated pan-objectivists say. Perception arises only after a complicated spatio-temporal process occurs. It is, indeed, to a considerable extent veridical; otherwise we should make more mistakes than we do in dealing with things. Natural selection has seen to that. But to a great extent it is *un*truthful, bringing before our minds characters which do not belong to the actual life of the things in question and do not exist in any space, public or private. Nor, I hasten to add, do they exist in any "subjective" realm, whatever that term may mean. *Qua* data, they need not exist at all. For, in a word, the

data of experience are, *qua data,* simply imputations, supposititious existents, which may or may not really exist.

This is, doubtless, a hard saying for many readers. It is the crucial point, upon which the theory developed in this volume depends. If you insist that all sensa are existents, out there in the world, because they *seem* to be there, there is nothing for it but to grapple with the puzzles of pan-objectivism. Most contemporary realists are, for the moment, following that lead, though one notices occasional misgivings and frequent inconsistencies. But one may be pardoned for wondering at the tenacity with which the original assumption is retained in spite of the difficulties it engenders. In Mr. Whitehead's *Concept of Nature,* for example, the following ultimatum is issued to the reader:

> "For natural philosophy everything perceived is in nature. We may not pick and choose. For us the red glow of the sunset should be as much a part of nature as are the molecules and the electric waves by which the men of science explain the phenomenon" (p. 29). "So far as reality is concerned, all our sense-perceptions are in the same boat, and must be treated on the same principle" (p. 44). This follows from his definition of nature as "what we are aware of in perception" (p. 28), "that which we observe in perception through the senses" (p. 3).

It is well to have that view worked out, if only to see what a mess it gets us into. But in this volume a much more discriminatingly empirical theory is adopted, which makes perception a sort of supposition, and makes perceptual data only presump-

tively, and by no means necessarily, a part of nature.

Some contemporary realists take what seems to be a sort of half-way position in this matter of reifying, or existentializing, the data of experience. For example, Mr. Broad declares as his view, in line with the other members of what may perhaps be called the Cambridge group of realists, that "the existence of sensa is absolutely certain, and those positive sensible properties which they seem to have they certainly do have" (*Scientific Thought,* p. 390). But he explains in detail (cf. the discussion of the space occupied by mirror-images, p. 317 ff.) that sensa may occupy positions in space only "from certain directions," and not necessarily "from all places" on any of these directions. Other writers speak of qualities as existing in a physical thing "for" a given observer, or "in relation to" him.

Now that there is some sense in such statements is clear. But surely all such relativistic statements need clearing up. What does it really mean to say that something exists somewhere "from a certain direction," or "for some observer?" If such statements mean that only certain observers are in a position or of a nature to have the perceptual data in question, the statements add nothing to what every one admits. But if they mean that these sensa really exist where they seem to exist, but only exist there *from* somewhere, or *for* some one, and not from somewhere else, or for some one else, then the statements, to my mind, are very much in need

of having some definite and intelligible meaning given to them. I submit that if something really exists somewhere, the qualifying clauses "from somewhere" or "for some one," are irrelevant. Existence is its own affair, so to speak, an absolute fact; an entity either exists or it doesn't. The difficulties arising from existentializing our innumerable data are not to be escaped in this prepositional way.[1]

On the other hand, I am in sympathy with Mr. Broad when he writes (p. 242-3), "You do not get rid of anything by labelling it 'appearance.' Appearances are as real in their way as anything else . . . *all* possible theories have to admit the reality, *in some sense,* of appearances." I am in sympathy with this statement, but I think it is not accurate. What we have the right to say is, that since there are such entities as "appearances," "data of experience," "sensa," or whatever you wish to call them, *something* must exist in each case, but not necessarily what we take to exist, what we think we perceive, in the moment of perception. A man in the desert "sees" an oasis on the horizon, with palm trees shading a well; that is his datum. The oasis does not exist; he is mistaken in thinking that

[1] In his latest book Mr. Broad has anticipated my objection and explained the view I am criticizing. The relation (of *pervading* and *informing*) that colors and visible forms have to the space they occupy is a triadic relation, expressible only by saying that the color pervades the space *from* a certain place. (*The Mind, etc.,* pp. 161-178.)

This view is verbally clear, but highly paradoxical; and it seems to me to raise more questions than it answers.

he sees palm trees, or anything else out there on the horizon. Supposing it to be a complete hallucination, all that exists is sensory events in his head. (Let us postpone for the moment the question whether these events are "physical" or "psychic.") Because of the way his body is made, and acts, he is unaware of his sensations as sensations, but is aware of supposed, but non-existent, palm trees. He may "see" them as clearly as you can see any tree on the horizon. . . . In just such a way we are constantly aware of all sorts of supposed objects out there in space; we "project" (in a sense and in a way to be explained later) our sensations, and suppose that we discover "sensa" out there in space. The sensa, the data of our experience, are the terms of our discourse, what we commonly take to exist; but they are not what exists. What exists is—the physical things which really are out there in space, and the sensory events in our heads. Our data exist only in so far as they coincide with one or the other of these two sets of existents.

Let not the reader say, It is paradoxical to assert that anything with the warm, felt actualness of a sensum may have no sort of existence at all. The felt actualness is the actualness of the inner sensory events of the moment. And the reason why the *datum* (or *sensum*) is not an existent is simply because it is a misdescription of these inner events, a misdescription caused by the fact that the organism is adjusting itself to something in the outer world; and by the further fact that the inner events are far

too minute and multitudinous to be described except *en masse*.

It is one of the purposes of this book to make the view thus adumbrated clear and plausible. Many of the terms used in the preceding paragraphs need to be explained, and many difficulties need to be met. But the reader is asked to be willing to adopt the hypothesis that the "sensa" which are held by most contemporary realists, on the evidence of perception, to exist in some outer space are, in a sense, the outward "projection" of inner existents; *i.e.*, they are merely imagined, or supposed, to be out there when certain inner sensory events occur. To be willing to believe this requires a mental wrench for many people. We are, and feel ourselves to be, in the presence of real things, menaced by them, using them, moving with relation to them. In the moment of perception we cannot distinguish between the data of our experience and these physical things,—the less so as our data often *are*, to considerable degree, these very physical things, viz., in so far as we suppose, or imagine, correctly. All our perceptual data are *presumptively* the very things known—or aspects of them; except as we become reflectively aware of illusion, we suppose ourselves to perceive things as they are. But this presumption is always open to question. It is natural to assume that all our sensa are out there, where they seem to be, and that the self-existent physical object (some combination of them, or bearing some describable relation to them) is *also* out

there. But the difficulties that arise from assuming this are so great that the view here urged turns out to cover the indisputable facts far more simply. Initially it is harder to accept; but when all the implications of both views are elaborated, it is seen to demand far less of a wrench to common-sense than the pan-objectivist view.

We have been speaking almost exclusively of visual data, because it is here that pan-objectivism is hardest to combat. Our case would be still more convincing if we spoke rather of the other senses. Common-sense distinguishes between the sound of a bell and the bell itself. And although we are apt to think of the sound as existing in the bell, or in the space between us and the bell, that does not seem nearly as obvious as that the color of the bell exists on its surface. Likewise common-sense distinguishes between the warmth felt from the sun's rays and the sun itself, which is, of course, enormously hotter. We do not even think of the warmth as existing in the space between us and the sun, which we have reason to call very cold. A few familiar observations strengthen greatly this discrimination of common-sense between the properties of outer things and the qualities of our sense data. For example, the pitch of the sound heard from a locomotive whistle is higher or lower, according as the locomotive is approaching or going away from the particular listener. Can we believe that sounds of both pitches (and, for that matter, of a whole range

of pitches that it might have for moving listeners) exist together through all the space where the various listeners may be? So, when one's two hands, after appropriate differential treatment, are plunged into the same basin of water, any part of the water that may be touched will feel cold to one hand and warm to the other. Can we believe the cold and the warmth to coexist as properties of every part of the water? It is not impossible to hold these beliefs, but if we do so we must radically revise our conceptions of nature. It is clearly far more natural and less complicated to believe that the physical things "out there" are relatively simple, and that the varying sensa, however "out there" they may seem to be, are simply our own individual and differing sensations mistakenly referred to the outer world.

Almost all realists admit that when we imagine or think or dream of an object, that object does not necessarily exist. Suppose, again, that I see a dragon in my dream. It may be seen as vividly, it may be as apparently "out there," as any complex of sensa that appears to me when I am awake. I may even be able to imagine the dragon in front of me when awake, and "see it in my mind's eye" as vividly as if the dragon were actually there. At any rate, it is only a matter of *degree* of vividness and realness. Because the realist knows that such experiences are inwardly engendered, he does not call these data "sensa," and does not think that they exist in outer space. But they *seem* to be out

there just as truly as any sensa. My *datum,* at the moment, is "a dragon out there"—an external creature with a life of its own independent of my life. What *exists* is a set of events in my head and a set of tentative adjustments of my body. The appearance of the dragon out there results from the "projection" of my cerebral image, a projection caused by the nature of my bodily adjustments, which are made as to an actually external dragon.

But if this alternative to the sensum-theory is accepted in the case of dreaming, imagination, and conception, why not accept it in the case of perception? If we can *apparently* have sensa "out there," when there are no sensa out there, but only images, inwardly engendered, why may not every case where a sensum seems to be "out there" be a case of inner events similarly projected? The felt difference between perception and the other cases can be easily explained on this view, and will be noted in Chapter III.

In general, the data of our awareness in dreaming and imagination are less likely to be veridical than the data of perception. But on the other hand, when we reflect critically on the existing world, our conceptual data are apt to be more truly the very existent things themselves than are the data of perception. For in critical reflection we expurgate our perceptual data and come to have as objects of thought what may more plausibly be held to be these very things as they actually exist about us.

The status of conceptual and perceptual data is,

therefore, fundamentally similar. What I "see" out there may or may not be there; what I "conceive" to be out there may or may not be out there. The appearance to consciousness of the object is not a guaranty of its existence, in either case. The fact that in one case an outer stimulus is affecting the organism, while in the other case only internal causes are at work, does not determine whether the datum of consciousness is or is not the thing as it really is.

As a matter of fact, there is no sharp line between perception and conception. As darkness grows it may be impossible to tell when we cease "seeing" a thing and are merely imagining it. Indeed, it may be useful to stretch the word "imagine," and to say that perception itself is *vivid, involuntary* imagination. The "givenness" or "appearance" of perceptual data, as well as of conceptual data, is the fact that they are imagined. Unlike what we ordinarily call imagination, the process of perception occurs whether we wish or no, if our sense-organs are acting; the nature of what we shall imagine to exist is (partially) determined by the vibrations reaching our brains from the things about us; and the objects thus imagined have a vividness and realness for us which our centrally excited images seldom have. But just as, when we dream, our dream-objects do not necessarily exist because we dream of them, so when we turn our eyes toward a physical thing, the sense-qualities that swim into our ken do not necessarily exist just because we

then vividly and irresistibly imagine them. We may say, to stretch another term, that all experience is dreaming; veridical perception or conception is *dreaming true*. The superior vividness, or steadiness, of the perceptual data, or whatever other differential characteristics they may have, while they rightly (when taken in conjunction with other reasons) lead us to believe that in such cases we are really looking at, and receiving influences from, the things about us, cannot guarantee that the particular data present to our consciousness at that time are the actual characteristics of those physical things.

This is not a "representative" theory of perception, in the historical sense of that term. There is, indeed, as every one must acknowledge, a certain amount of concomitant variation, and thus representation, between events in the knower's head and events in the outer world that are their remote causes. But our perceptual data are not those events in the knower's head, they are the imagined outer existents. In so far as perception is veridical, the outer existent supposed, imagined, dreamed, *is* the very existent affecting our organisms. The data of experience have no existential status of their own; they are not a screen interposed between us and the things we know. On the contrary, whenever we have knowledge, it is because the very things we know, or some of their characteristics, are present to our consciousness, data of our ex-

perience. And it is only because we often have error instead of knowledge, and usually have some admixture of error with our knowledge, that it is necessary to distinguish between the data of our experience and the things as they actually exist.

To sum up, it is not plausible to suppose that the qualities present to consciousness are actually *put into* the physical thing, or created out there in space somewhere, by the process of perception or conception. Nor is it plausible to suppose that they are *found* there and merely reported to the perceiver. Rather, they are imputed, imagined, dreamed, by a complicated process to be described in detail in this volume. The result of this process is that we do actually have as the data of our perception, our imagination, our dreaming, the actual existents that make up our world, in so far as the processes involved do work to that end. We have always been told that seeing is believing. This is a statement to be taken literally: even seeing is a form of believing. Even when we walk by sight we are still walking by faith.

CHAPTER III

BELIEF IN THE PHYSICAL WORLD

Human beings, we have said, are instinctively realists; they believe themselves to be surrounded and menaced by independently existing things, things that have a life of their own and make up a world far richer than that of human experience. But, as we have seen, there are many features of the data of our experience which, reflection leads us to believe, are not features of the existents surrounding our bodies—for example, the colors of our visual data. We have other data, such as hallucinatory and dream-objects, which we do not believe to exist at all. Yet these data may be just as vivid, just as truly "given," just as apparently "out there," as any other data. Hence arises naturally a suspicion that the realistic attitude itself is naïve, that *all* the data of experience are merely dreamed, as it were, and that there is no world of independently existing things to be known. This "subjectivist" attitude would seldom occur to any one but a sophisticated philosopher. Nevertheless, it is conceivable that the truth requires sophistication to understand. And a theory based upon subjectivism can be made to cover all the facts of experience. Thus, if we are to retain our instinctive realism, we must justify it.

Consider again the case of hallucination. The hallucinated patient *sees* the hallucinatory object—say "a red dragon out there"—as vividly as you and I see the ordinary objects of our experience. Yet you and I agree that the hallucinatory object does not exist; there *is* no red dragon out there—or anywhere. But now, how do we know that *all* the objects of which we are aware are not in similar case? If these objects appear to us in regular sequences under discoverable conditions, it will be possible to construct an imaginary world into which they will fit. Perhaps, then, the supposed independently existing physical world is but a conceived pattern, a "construct," of great usefulness in enabling us to predict and control our experience, but with no existence of its own. In that case our fragmentary experience (fragmentary from the point of view of the total conceived *pattern*) would be the whole of existence. This would be a philosophy of "pure experience"—*i.e.,* a philosophy which refuses to believe in anything outside of experience. It would not be difficult to explain, as John Stuart Mill explained long ago, the genesis of the *belief* in independent physical existents, if experience were really all that actually existed; and having seen how inevitably the illusion of realism would arise, since experience is patterned as it is, we could not be shaken out of our subjectivistic conclusions by the fact that we are all irresistibly subject to that illusion.

But there are two telling lines of argument against

this subjectivistic view, which we may call the negative and the positive arguments.

The negative argument points out that there is no more reason for denying the independent existence of physical things than for denying the independent existence of other minds, or of our own past. Every one, including the subjectivists, believes that his own past life was real, although, in the nature of the case, it is not existentially present now, and far the greater part of it, certainly, is not even remembered or thought of in detail now. If we were to reject the legitimacy of this belief in what is now absent, we should be left with but the present, momentary flash of experience; that is all that is, strictly, indisputable. Memory might conceivably be an illusion; we might conceivably have been born this morning, or a moment ago, with a stock of illusory beliefs in a past. But actually, we all trust memory, in general. A memory-experience is not merely a present event, it constitutes knowledge of another event, a past event.

Likewise, we all believe that other people are having (in some sense or other—and any sense suffices for our argument) emotions, feelings, hopes, etc., though this mental life of theirs is outside of and in addition to our own mental life. To reject this belief would be to become a solipsist, which would be madness. But to believe in the independent reality of other people's mental life is, in so far, to trust the objective validity of perception,

since it is because of certain perceptual experiences that we come to the belief in other people's minds.

In both these cases the reality believed in is beyond the present mental life of the knower; knowledge of it is transcendent. Why, then, should we practice an arbitrary skepticism and refuse to trust the objective validity of perception when it seems to reveal to us the existence of physical things? The only consistent skepticism would be one that refused to exercise *any* epistemological faith and confined the skeptic to staring at the data that appear to him at each present moment. But life demands far more than that. It is, indeed, possible to deny the existence of physical things, and still, by retaining belief in one's own past and in other minds, to retain a world sufficient for one's practical and emotional needs. But from the evidential point of view, such a limitation of belief is arbitrary. Faith in one's own past history, and in the mental histories of others, remains faith, incapable of proof; and on the other hand, the many excellent reasons for holding this faith can be matched by equally excellent reasons for retaining faith in the existence of the physical world.

It is the unfolding of these reasons that constitutes our second, or positive line of argument for realism. I proceed to summarize some of the more obvious of them.

1. Consider *the felt difference between the data of our imagining, thinking, remembering, on the one*

hand, and our perceptual data, on the other hand. Images, concepts, memories are relatively weak, faint, blurred; percepts, by contrast, clear, vivid, detailed. The former are flickering, unsteady, kaleidoscopic; the latter tend to be relatively steady, unchanging, enduring. The contrast is, indeed, not always so sharp as this; and there are borderline cases where it is difficult to decide by introspection whether we are having a sensation or an image. But the differences are in general well marked. We must, of course, in order not to beg the question, refuse to be biased by the realistic terms of ordinary speech in which perceptual experiences are described. But the felt differences themselves between these two great classes of data of our experience remain. They are easily explicable if realism is true. If realism is not true they remain features of our experience for which no explanation is offered.

2. The data of conception, of memory, of dreams, are found to be isolated, outside of that *continuous context, or setting, that characterizes our perceptual experience.* In all cases of perception there is a continuity among our data, of which we are more or less clearly conscious, as if they belonged to a single spatio-temporal order. As Mr. Montague puts it (*Journal of Philosophy,* vol. XXI, p. 320), "I can not perceive a chair without perceiving the bridge of spatial extension between me and the chair. It is this felt continuity of the space of the chair with the space of my body that gives

the chair as a perceived object an *orientation* which conceived objects lack. The latter are in this respect like landscapes in a picture. They may be vivid enough intrinsically, but we should not know how to walk into them." Again we can say that this difference between these two classes of our data is intelligible on the basis of realism, but is otherwise meaningless.

3. *Many experiences seem to reveal to us a mechanism of perception*, i.e., vibrations coming from physical things, events in sense-organs, nerves, and brain. Except when experiences of this general nature, but in each case of a very definite sort, have been obtainable, by the proper procedure, in the immediately preceding moments, no experiences of the perceptual sort (as above described) are possible at all. In ordinary phraseology, the one class of data is apprehended by looking, listening, or using the sense-organs, the other class of data by what we call the association of ideas. It is possible, of course, to believe that the percepts that seem to reveal these objective processes are merely experiences of our own and nothing else, and that the unperceived parts are merely further potentialities of experience. But, if so, these detailed correlations between the perceptual experiences and the long sequences of highly particularized potential experiences, remain unexplained, mere brute facts to be accepted. Whereas realism has a satisfying explanation at hand. In other words, the dependence of our perceptual experiences upon earlier poten-

tial experiences that seem to reveal a mechanism of perception looks exactly as if such a mechanism of perception, giving us knowledge of our physical environment, were objectively real; and it has no meaning upon any other hypothesis.

4. *The sequences among our perceptual experiences themselves seem to reveal the march of another life than our own.* We are in the presence of an Order which changes on its own account, few of these changes falling within our experience, but the bits of our experience being such as to fit into the Order. For example, I start a fire on my hearth, go out of the room, and return later to find, in place of a pile of sticks, a small heap of hot ashes. It is easy to piece out the gap in my experience with a conceived series of experiences that I might have had if I had been, as we realistically say, in the room. But I did not actually have these experiences, and usually do not even imagine them. Thus here, as commonly, the only intelligible Order of events lies in a realm outside of my experience. My perceptual experiences regularly have the marks of belonging to such an Order. They often jump into my train of experiences abruptly, without relation to previous items in that series. Upon awaking from sleep I pick up the sequence of this Order at the point which it has then reached, without respect to the preceding period of emptiness or of irrelevant dreams in my mental series. What meaning is there to all of this, if it be not that this unescapable and dominating Order is the order

of an existing world about us, which our bits of perceptual experience fragmentarily reveal?

5. *Consciousness depends for its continuance upon physical events;* directly, upon brain-processes, and, less directly, upon events outside the brain. If a heavy stone falls, unseen, upon my head, my consciousness ceases, temporarily or forever. On a realistic view this is intelligible. But how can a subjectivist explain the destruction of consciousness by what, upon his theory, was but a series of potential experiences! Similarly, our mental life is dependent upon air, warmth, food, and water. It is altered or brought to an end by drugs and poisons, by bodily injuries which directly or indirectly affect the brain, by anything which vitiates or withdraws the supply of blood that keeps the brain-process going. We are evidently at the mercy of a Reality bigger than we; we are surrounded by dangers; and our mental life exists precariously in the midst of an environment with which it must keep on good terms. We cannot, indeed, demonstrate logically that this is so. But if it is not so, our experience is extraordinarily deceptive, so cleverly deceptive that it is impossible, practically, to resist yielding to the deception, and impossible otherwise to find any meaning in our situation.

6. *The data of our different senses coalesce beautifully to give us, apparently, knowledge of single physical things.* A visual datum is a sign that certain other visual data, and certain tactile

and kinesthetic data can be had. Similarly, the percepts that appear to various people, while somewhat different (if we judge by discourse), are so coordinated that they also serve as, apparently, revelations of a single world of physical things.

7. *The time-gap, in discourse, between the expression of an idea by one speaker and its reception by another* is meaningless if it be not due to the traversing of a real space between. The time-gap apparently measures the time necessary for the air-waves, and other intermediary events, to take place. On the basis of a subjectivistic mental pluralism the fact of this time-gap, like all the facts which we have been pointing out, could be described, but could not be explained.

8. Unless realism is true, *the whole stretch of cosmic history prior to the advent of minds upon the scene had no existence,* just as whatever is not now perceived or conceived by some mind has no existence. As between such a shrunken world, miraculously springing into existence when the first animal minds began to function, and the complete, if but partially understood, world of realism, what sensible person can hesitate?

9. *The mind is essentially a reactive mechanism;* so psychologists are telling us. But a "reactive mechanism" is a meaningless conception unless there is an existent environment to which it can react. Indeed, according to the view unfolded in this volume, there is no consciousness at all except as there is incipient reaction, a completed neural

arc with some sort of motor effect. The mind is an organ for adjusting the body to the world; thinking is a refinement upon this process of adjustment. It is, then, not only the immense range of the physical sciences which is meaningless, psychology is likewise meaningless, except upon the assumption that there is a really existing world of which the mind gives information and to which it helps the organism wisely to react.

Are we not warranted, then, in saying that a philosophy that refuses to admit the existence of things beyond our experience is lazy? Such a philosophy contents itself with describing our experience, refusing to make any attempt to explain its most striking peculiarities. But surely these peculiarities are *explicanda.* And the explanation can only be in terms of this wider world than that of our piecemeal experiences, which these experiences themselves so irresistibly suggest. What the substantial nature of that world is, is debatable, and will be discussed later in this volume. But in any case, that world is real, existent in its own right, and is, in some degree, revealed to us by our perceptual experiences. If that is not the case, the outstanding peculiarities of our experience are utterly misleading and meaningless.

The status of the evidence for realism is similar to the status of the evidence for the evolutionary theory of organic life. Every intelligent person today, except those hopelessly biased by loyalty to

an ecclesiastical tradition, accepts this theory. Yet the theory of creationism can not possibly be disproved. The point is this: if creationism is true, why does everything *look* as if evolution were true? Exactly so, if anyone refuses to believe in anything beyond the narrow world of experience, he cannot be logically coerced. But we can ask him, why does everything *look* as if realism were true?

Nor is it an acceptable answer for him to say, "Of course, I believe in the physical world; but what is the physical world?" It is "the objective order of experience," "a framework for the ordering of experience as a whole" (G. S. Fullerton, in *Essays in Honor of Wm. James,* pp. 25, 49). Such a doctrine, though called "realism," is not realism in the common understanding of the term; it is, indeed, what is here called "subjectivism," and would have been heartily assented to by John Stuart Mill. At any rate, apart from the question of the proper label for the doctrine, that doctrine does not satisfy the arguments adduced in this chapter, which demand for physical things an independent existence, quite apart from their relation to our experience.

The pan-objectivist is apt to say that when his form of realism is abandoned it becomes more difficult to affirm the independent existence of physical things. To this I must demur. All forms of realism are in the same logical position with respect to this difficulty. The belief in the identity of any datum of consciousness and an independent existent

is, for all realists, strictly speaking, a hypothesis, not an unquestionable fact. The contrary, anti-realistic belief would, of course, also be a hypothesis. It is impossible for *any one* to *prove* realism to be true and impossible for any one to *disprove* it. The grounds on which we can reasonably hold realism to be true are such as I have just summarized. And these considerations point to the clear-cut, scientific sort of realism here advocated, rather than to the chaotic, anthropocentric realism of the dominant British and American philosophy.

The fact is that the particular tenets of the various groups of realists are all harder to defend than the realism which they hold in common. Pan-objectivism holds that *all* the characters of our sensa exist in the external world. The doctrine here defended holds that only *some* of them exist in the external world. But the realistic faith is more fundamental than either of these specific doctrines, and far more easily supported than either of them. The realistic hypothesis seems to all realists overwhelmingly evidenced. In fact, the difficulty in believing in a nature independent of mind seems to us rather a gratuitous difficulty, the affliction of a few people who are obsessed by dialectical puzzles or who seek an escape from the confines of the natural world. But the discussion of realism *vs.* anti-realistic views is a very different matter from the discussion of the relative plausibility of the various kinds of realism.

If the pan-objectivists' doctrine, that all those

data of consciousness that they call "sensa" have real external existence, could be proved true, realism would indeed be, in so far, proved true. (I say "in so far," because the world as science conceives it, with its atoms, electrons, etc., would still not be proved to be an existing world.) But this particular belief of pan-objectivism has to meet difficulties far greater than those that stand in the way of the belief in realism in general. Whatever difficulty there may be in the way of a belief in a realistic world, that belief does not necessarily involve us in these difficulties of pan-objectivism. So far as the more fundamental problem, of realism *vs.* anti-realism, is concerned, all we realists are in the same boat.[1]

To the end, realism, like any other metaphysical theory, remains, in strictness, a hypothesis. In the nature of the case each of us is in what Mr. Perry has called the egocentric predicament. But the fact that there could be no possible way of *proving* anything to be real beyond the momentary throb of one's own life (if indeed that could be proved to be real) implies that our inability to furnish *proof* is in no degree negatively evidential. What could not, in the nature of the case, be done is not to be expected; and no conclusion is to be drawn from the fact that it is not done. In other words, the evidence for the existence of the physical world is as

[1] I am glad to see that in his latest book Mr. Broad makes this same assertion. On *any* realistic view worth discussing, the existence of physical things is, strictly, hypothetical. (*The Mind, etc.*, pp. 190 ff.)

strong as it could possibly be for beings that are microcosms within that world. Let us call realism a great hypothesis, held at first because of a practically irresistible instinct (which gives it an initial presumption), and later, upon mature consideration, because the facts of experience fit into it far better than into any other hypothesis.

CHAPTER IV

PERCEPTUAL KNOWLEDGE OF REALITY

Having justified our realistic belief in the physical world, we may proceed to ask what sort of knowledge we have of that world. We have a great body of common-sense knowledge, and we have that knowledge enormously extended and refined by the physical sciences. All this knowledge rests, ultimately, upon perception. Science may correct the errors of perception, and discount its bias; but to the end it is limited to the sort of knowledge that perception can give. Hence a study of perception itself, while not a necessary precedent to the development and practical usefulness of physical science, is the necessary pre-condition of an accurate determination of its ultimate meaning and value.

Let us put our question in its most radical form: How do we know that perception, and therefore science, *ever* gives us knowledge? We can not put our experience side by side with physical things as they exist independently of experience, and compare the two. May it not be, then, that the real objective nature of things is unknown to us, and that we live in a world of our own imagination, far removed in its characteristics from the world of things as they exist apart from our notions of them?

We may at once admit that we can never absolutely *know* when we have knowledge. But if we could not have knowledge except as we knew that we had it, we could not know that we had it without knowing that we knew that we had it, and so on, in an infinite regress. So the utmost that we can ask for is a well-founded confidence that we have knowledge. And our question is, Under what circumstances are we warranted in having that confidence?

The obvious answer is the one commonly given today, that we may legitimately consider that our supposed knowledge is actual knowledge when it *works*. When we use it to guide our action, we find ourselves dealing successfully with things. We deduce consequences from it and find our experiences befalling as we expected. This practical verification ordinarily satisfies us. How could we deal successfully with things and make successful predictions if our supposed knowledge were error?

It would not be accurate to say, as some pragmatists have said, that verification *made* our beliefs true. If they were true at the time of verification, they were true before verification, and would have been true if they had never been verified. The key in my pocket does not become the key to the front door when it opens the lock; that practical success merely confirms my belief that it was the right key. It would still be the right key if I had never tried to use it. It would be the right key because it was made to fit, and actually does fit, the lock.

Verification, then, is simply a *test* of knowledge. It is a test not always applicable, and not the only available test. We may also test our knowledge by noting its internal coherence, or the method used in reaching it. Long experience has resulted in the development of a scientific technique for attaining truth; conceptions reached in that way have been found to stand the test of practice, and to fit in coherently with other verified truths. But knowledge must not be confused with its tests. Knowledge itself consists in the relation of identity between datum and object cognized; it is, in Mr. Santayana's phrase, "fidelity to the object."

In physical terms, knowledge consists in our afferent and efferent relations to the things known; that is, in events in the sense-organs, the neural arcs, and the muscular system. This process gives us in the brain a group of sensory elements corresponding point by point to the characteristics of the outer things which are known, and a group of motor tendencies adjusting the body to them. Knowledge is not merely the potentiality of successful practice, it is sensory as well as motor, an effect of the things known as well as a possible cause affecting them. Like the key, it is knowledge not only when it opens for us the locks of nature, but, prior to that, because it has come into existence to open those locks and is the sort of thing that fits them. The sensory states in our brains vary sensitively with the variations in the world about us, and because they do so, they are able to evoke such

motor responses as adjust the organism to that world.

This is, of course, only a part of the story; knowledge is something more than a set of physical relations. The term "knowledge" implies consciousness—the appearance of these visions which are our data. But this sense of the term "knowledge" is closely correlated with the physical sense. Whenever we are conscious of the actual nature of things, our cerebral states are reproducing in some degree their pattern, and our bodies are being properly adjusted to them. The neural events and bodily adjustments are the physical basis of knowledge. Without them we could not be conscious of anything; and according as they are appropriate is our knowledge accurate.

But now we must make a further admission. We must admit that, to a degree, what we call verification and successful action are compatible with knowledge that is only symbolic and not literal. For example, physical things may not have colors; but if a certain sort of event in them regularly gives us color-sensations, and if every difference in the sort of event in question makes a difference in the datum of our experience, the literal nature of the event in the object is of no practical moment to us. The reason why a color-blind person's perception is not practically adequate is not that he sees a different color from most of us; there is, indeed, no way of knowing that those of us who have

"normal" vision all have similar color-experiences, and it does not matter whether we do or not. What matters is that we should be able to discriminate between all the significantly different events in the object, and use common names for them. The disqualification of the color-blind man lies in his inability to distinguish between two different situations which produce two different color-sensations in the ordinary observer.

We must never forget that common-sense knowledge is essentially practical; its concern is, primarily, to deal successfully with things and to predict our experiences. It talks in terms of our experiences; these terms may to a considerable extent differ from those which it would be necessary to use if we were to describe literally the nature of the independent things we are talking about. What sense-data we shall have, depends, indeed, upon the actual nature of things; they vary *pari passu* with variations in their stimuli, and so give us genuine information about the outer world, even when the information is in symbolic terms. But what sense-data we shall have depends also, and more directly, upon the characteristics of our sense-organs and brains; and so it is obvious that they will have, in some degree, the impress of our own nature.

Just how far then can we believe our knowledge to be literal, and how far symbolic? It seems to me that the older realists were on the right track here. The secondary qualities are not to be regarded as aspects of the life of physical things, but as aspects

of our data which are merely symbolic of physical events. On the other hand, *the primary qualities of our normal perceptual data* may (in so far as perception is accurate) be regarded as literally features of the existent world in the midst of which we live. That is to say, the considerations noted in the preceding chapter that warrant us in being realists, warrant us in believing that the data of our experience are veridical, so far as physical objects go, only with respect to their size, shape, position, motion, mass, etc.

The reasons for the extrusion of the secondary qualities from the physical world were given in our opening chapter. There are too many of them; to believe them to exist in outer space would be to make physical things mere blurs of innumerable colors, sounds mere blurs of innumerable pitches, and so on. Everything fits in with the alternative supposition that they are, in a sense to be later explained, organism-made, and are merely imagined to be in the place where we seem to perceive them. They would still constitute symbolic knowledge of the varying events in the outer world that produced them.

The same remark must be made concerning the primary qualities that appear when, instead of retaining the perceptual attitude, we fall to considering our sensations themselves. The elliptical shape that appears when I note the actual sensible appearance of a coin held slantwise to my eyes is a case in point. And perceptual data fall under the

same category in so far as we have reason to believe them illusory because of the more convincing testimony of other senses; for example, the visual bentness of the oar, or the position and reversal of things seen in a mirror. There is an infinite variety of such data, and they cannot be located in outer space without making an extraordinarily chaotic world. On the contrary, we can come to see how the varying sensations are produced in the various observers' experience, and how such illusion as occurs takes place through the mistaken reference of these sensations to the outer world.

On the other hand, in so far as the primary qualities of normal perception go, we may feel confident that we very often have literal knowledge, *viz.,* to the extent that perception is accurate. Of course, these data are "organism-made," too. That is, just such data appear to us because we have just such organisms as we actually have. But in this case, the process succeeds in *hitting the mark.* Psychologically, all experience is on the same footing; but epistemologically, our experiences differ widely in value. This distinction seems to be persistently overlooked in contemporary discussion.

The fact is, the veridicity of our normal perceptual data is being constantly verified. We see a thing as ten feet away. We then take ten steps of a foot each and reach it. In such ways we constantly verify the accuracy of the perceived distance of things. The same can be said of our perception of their size, shape, and motions. While we are

retaining the perceiving attitude we see a coin as round, no matter what its position; this perceived character "roundness" we have good reason to believe is a literal characteristic of the piece of copper or silver in that portion of space.[1] For such a supposition co-ordinates our various sense-data; if the coin really is round we can understand why we see it as round in ordinary perception, and why the various other shapes appear to us when we note our sensations. If the coin is not really round, the peculiarities of our sense-data are unintelligible. In short, all the arguments that we adduced in the preceding chapter to justify our belief in a real world, justify our belief in a real world composed of things that have the sizes, shapes, pattern, and motions of the world that science describes. *For only such a world, in detail, serves to explain the concrete peculiarities of our experience.*

Science, then, can explain the peculiarities of our sense-data as due to the effects produced upon our organisms by things that have the primary qualities of our veridical *perceptual* data. Indeed, as we

[1] I do not, of course, attribute any *sensuous quality,* in this case, to the physical thing. What I attribute (my datum, in the case supposed) is the geometrical property "roundness." It is the failure to distinguish between sensuous qualities and physical properties that has led so many realists to say that primary and secondary qualities are on the same footing epistemologically. In introspection, or inspection, we are aware of sensuous qualities. In perception we are concerning ourselves with the (apparent) physical properties of the things about us. It is *such* characters that I assert to be (often) veridical. I have retained in the text the common term for them—"primary qualities"—although that term is ambiguous and misleading.

shall presently see, our perceptual data are what they are because of a process by which an organism corrects the idiosyncracies of its sensations, using them not for what they are, but as a means toward knowing the outer thing. Moreover, science explains the peculiarities of our *secondary* qualities as due to effects upon our organisms of further primary qualities resident in things. For example, our color sensations are due to the oscillations of certain electrons in the things we look at, our sensations of heat, and of sound, to other vibrations. So, after we have counted out the aspects of our sense-data due to the nature and position of our organisms, we are left with a mass of information concerning the size, shape, distance and direction from one another, of physical things, at any one moment, and a history of the direction and velocity of their changes in position, size, and shape, in time. This is the sum-total of physical knowledge. It tells us the *pattern* of outer events. Its goal is to analyse the motions of the units of matter into the fewest possible types of motion, and to discover the actual pattern of these moving units in the spatio-temporal Order.

It is a mistake to say that science *ignores* the qualitative aspect of things. It has no means of *discovering* any such aspect of *things*. All that it is warranted in telling us of physical things is their structure in space and time. Atoms, electrons protons, ether-vibrations—these are but names for units of such and such a shape and size, arranged in

such and such a pattern of co-existence and sequence. Of what *stuff* these units are made, what their *substance* is, apart from the order in which they are arranged, the physical sciences cannot tell us. This structural knowledge is all the knowledge we need for practical life. But the question remains, Can we suppose things to exist as a mere pattern, without substance? If not, of what substance are things made? This is a question which does not arise on the level of pan-objectivism. But if we agree with the preceding argument, the question becomes a pertinent one. We have taken away the qualities that seem to fill out the pattern of nature, and ask what we shall put in their place. The question is answerable on our theory, as we shall soon see.

CHAPTER V

BELIEF IN MENTAL STATES

The preceding discussion has pointed out the justification for our belief in the existence of nature—a real existence, on its own account, an existence of units arranged in such an order as is revealed by physical science. The present chapter will aim to justify an equally realistic belief in the existence of mental states. Hitherto, to postpone discussion, we have spoken usually, in rather vague terms, of the Knower or Perceiver or Organism. We must now attempt to make clear what sort of nature the knowing organism must have, in order to know. Certainly, whatever other Knowers there may be in the universe, those with which we are familiar are living organisms. And our question is, Just what is it about these organisms that gives them this apparently mysterious power of transcending themselves, of knowing other life or existence beyond their own?

The contention of this chapter is that the *sine qua non* of knowing is the possession by the organism of a set of continually changing mental states in certain definite causal relations with the surrounding world. Later we shall see that these mental states exist in the brain; they are an aspect of the intricate brain-processes by which the organism

steers its life in the midst of a threatening and promising environment. In fact, they are the very substance of those brain-processes, and an integral part of the physical world. It is not the view of this book that there is an insubstantial, "subjective" realm. The term "mental states" is used because this is the accepted term for the reality studied in introspective psychology, and because the clear recognition of this reality reveals an aspect of nature which we are apt to overlook if we think of it merely in the terms used by the physical sciences. It is important to note, however, that the mere existence of these mental states would not constitute knowledge, or consciousness. It is because of the causal relations between them and the world of objects known that the peculiar function arises that we call consciousness. The mental states are effects of these objects, and causes of the reaction of the organism to them. Because of this complex of relations, the organism is "conscious" of the objects.

Introspection has always *seemed* to give us knowledge of mental states, just as perception has seemed to give us knowledge of physical things. Our theory holds that this realistic claim of introspection is essentially valid, just as the realistic claim of perception is essentially valid, though there is a certain amount of inadequacy and illusion in both cases. The states of blind animal feeling, self-contained, anoetic, referred to in an earlier chapter, are one type of what introspection seems to dis-

cover. But introspection may be applied to any form of mental life, and always seems to reveal existents different from those which physical science describes. Common-sense, as well as introspective psychology, holds firmly to the belief in mental states; and our theory, embracing this belief, has, as in the case of physical realism, the initial presumption in its favor of coinciding with common-sense and the natural interpretation of a considerable body of knowledge.

Common-sense believes not only in our own but in other people's mental states—something over and above the behavior of their organisms as described in physical terms. It is quite conceivable that a human body should be an unconscious automaton, going through all the motions of living and loving, but feeling nothing. But a sweetheart of that sort would not be satisfactory. We want to believe, and we do believe, that our friends not only behave well towards us, but *love* us. And the sense in which we use the word love is not the sense in which it is used by the radical materialists.[1]

But in spite of the momentum of our common-sense belief, it may be desirable, in so far as this book is addressed to philosophers, to plead for a fair hearing for the belief in mental states. Recent philosophy has tended to rule them out, and to think of the receptive and reactive mechanism of

[1] The philosophic reader will see that I side in this matter with William James and Mr. Dickinson Miller rather than with Mr. Singer. Cf. the articles in the *Journal of Philosophy, etc.*, Vol. VIII, pp. 180 and 322.

the organism in purely physical terms. And this for two main reasons. It has been afraid that to admit their existence would make knowledge impossible. And it has not known where to put them, or how to conceive the relation between their existence and that of the physical brain-processes.

There is, however, a place in the world of nature for mental states, as we shall presently see. And far from making knowledge impossible, they alone make it possible. Mental states are not the *objects* of our knowledge (except in introspection), they are not a screen interposed between us and the world. On the contrary, they are states of the Knower; and it is only because they exist that anything can "appear" or be "given." A purely behavioristic psychology can indeed describe fully the behavior of an organism; a purely materialistic physics can describe the pattern of the whole world of nature. And this might conceivably have been the whole story. Physical things stimulating a purely physical, non-psychic organism might have evoked the most delicate responses. But they could never have evoked conscious experience. *Consciousness* is something not fully describable by either physics or behavioristic psychology. It is a function which organisms are able to exercise only because the events directly concerned are psychic in nature.

The representationists, or dualistic realists, have recognized the existence of mental states. Their mistake, crystallized in the ambiguous word

"ideas," has lain in their failure to distinguish the data of experience from the states of the Knower. They have thus confused two categories which should have been kept distinct. By the phrase "data of experience" we mean what is "given," what is "before the mind," the objects of our awareness. We live as in the presence of external objects, and these objects of our awareness, not our mental states, are the counters of our discourse—except, of course, when we become introspective. For example, I look at a fire on the hearth; my datum is "That hot, red, crackling fire, three feet long, ten feet from my body." In order to have such an object of awareness, I must have certain visual, auditory, kinesthetic, and heat-sensations. But it is not these sensations of which I am thinking. I am thinking of the *fire,* I am seeing the *fire.* If I have correctly (though, of course, inadequately) described the object of my awareness at the moment, it is impossible to identify it with any group of my mental states. For my mental states are certainly not three feet long, certainly not ten feet from my body, certainly not a *fire.* The fact is, that although the relevant *existents* are mental states in my head and physical events in outer space, my datum of consciousness is not exactly either of these, but a sort of logical hybrid of the two.

But, it may be objected, if it is not our mental states of which we are aware in perception, how do we know that the mental states *exist* when we

are perceiving? And how can they exist without being known? To the latter question we answer, we do not mean here by "mental states" anything whose *esse* is *percipi;* nothing exists whose *esse* is *percipi.* Cognition is a complex function which only arises under certain conditions; mental states, to be directly known, must be cognized, *i.e.,* introspected. But we may assume that mental states exist at times when we have not turned the searchlight of introspection upon them, when, on the contrary, our attention has been turned outward and focused upon the stream of presumptive physical things that makes up the greater part of our experience.

Our reason for assuming the existence of mental states is similar to our reason for assuming the existence of the outer world. Experiencing is itself an *explicandum.* In order to account for the peculiarities of experience we are obliged to believe in the physical world. In order to account for the very fact of experiencing, we must believe in the existence, in the organism, of a reality of such a sort as to make experiencing possible. Otherwise, the fact of experiencing (or consciousness) itself would be unintelligible. Realism can not be content with describing the world as consisting merely of physical existents affecting physical organisms, as the word "physical" is commonly used. For those existents become "given," become data of consciousness. That is an additional fact, not to be minimized or glossed over.

Few contemporary realists seem to have a solu-

tion to offer for this problem. Some of them *state* the problem, as, *e.g.*, the problem of "the presence-in-absence" of the object known; (*i.e.*, although the object has another locus, perhaps far removed in space or time, or both, from the knower, it is yet in some sense "present" to the knower, apprehended by him in the moment of perception, conception, or memory.) Mr. W. P. Montague, indeed, not only recognizes that "How it is possible for the here-and-now to reveal what is there-and-then is the epistemological mystery" (*Journal of Philosophy*, vol. XXI, p. 323), but, in his theory of consciousness as potential energy, makes a bold attempt to solve the problem. That theory seems to the present writer far less plausible than the view developed in this volume, and open to many objections.[1]

[1] Mr. Montague's theory is a form of pan-objectivism, holding that sensuous qualities, such as color, exist throughout nature. It is therefore open to all the objections to that doctrine.

Its identification of consciousness with potential energy is conceivable, *a priori; i.e.*, wherever physics speaks of potential energy, there might be an *actuality*, viz., consciousness. But (if I understand the theory) this can only be *consciousness of* what the physical energy there stored up is *potential of*. It is not clear how such a theory can explain the varieties of our human conscious experience. And, in any case, it seems to me to involve a misunderstanding of what consciousness *is*. The transcendence of consciousness seems to me still magical, on this theory, as it is (so far as I can see) on every theory except the one unfolded in this volume. There is, indeed, an analogy between potential energy and consciousness. But the presence of the former does not explain the appearance of the latter.

It is, of course, also obvious that on Mr. Montague's theory there must be an enormous amount of consciousness in inanimate things. Think of the amount of potential energy, and, therefore, of consciousness, in a stick of dynamite! And there must be about as much (or more?) consciousness in the brain during dreamless sleep as during waking hours.

The points above mentioned might be elaborated. But, after all,

But at least it shows a serious recognition of the problem. Most of the other "new realists" content themselves with stating the cognitive situation, but offer no explanation of how it can arise. This world of physical organism and physical things surrounding it is not enough of a world to explain the fact of consciousness. They rightly refuse to call the usual *objects* of consciousness mental states, but fail to see that these objects would not be objects for *consciousness* if there were no psychic life, in addition to organism and things as conceived by physical science.

In so far as perception and conception are veridical, I can agree with the fundamental contention of the American neo-realists, that the object before the mind is identical with what really exists and is cognized by these processes. What happens in cognition is not the coming into existence of a second object, a copy, or picture, of the object known; what happens is that the object known, which has, prior to the cognition of it, its own causal context as a part of the physical world, now gets into a new context, namely the history of the stream of experience of the knower. I say, with this state-

my chief objection to the theory is that it does not explain the peculiarities of consciousness. When mental life is taken to be the substantial aspect of neural processes, it becomes possible to understand the peculiarities of consciousness in great detail, by studying the neural and reactive processes of organisms. "Fusion," "projection in space," and "projection in time"—the processes that underlie perception—are processes involving the motions of matter, not merely "potential energy." And Part II of this volume will show that consciousness can be *understood* in detail, and its origin in a world of matter made intelligible, on the theory there developed.

ment I have no quarrel. But it does little more than set the problem. How *can* the thing known get into the new context? What sort of status has this context, consisting of the various data of which some one person is aware? Just the fact that a physical thing causes a physical organism to move in some way offers no more explanation of *consciousness,* in the ordinary sense, than the fact that it causes non-organic bodies to move in various ways. An ether-wave reflected from a book strikes my eyes. Certain molecules disintegrate in my brain. My organism makes certain slight muscular movements. The *book* remains on the other side of the ether-waves from me. Yet *I, here,* am conscious of the book—its size, shape, color, even its content, to some degree, if I recognize it. How has the book got across the chasm of ether-waves (so different from the book) and joined up, so to speak, with the bodily sensations, the emotions and dreams, the memories and wishes that compose my stream of experience? Surely this neo-realist formula of differing contexts cries out for elucidation.

Moreover, there is a further complication to be considered. *Non-existent* entities become objects of my awareness, mingling inextricably with the existent entities. It is hard enough, on the basis of a purely physical realism, to see how really existing things, separated, as they are, from the perceiver and from one another by a heterogeneous medium, can somehow be compresent in the perceiver's experience, in what Mr. Dickinson Miller

calls a "pool of conjoint phenomenality." It is still harder to see how non-existent things can be compresent with these existents, and in the same vivid way. Call them subsistents, or neutral entities, if you like; the point is, we *see* them, or *hear* them, or *imagine* them, as the case may be. Difficult as it is for our contemporary realists to explain how we can see (*i.e.*, be conscious of) what is *there* to be seen, it is even more difficult for them to explain how we can see what is *not* there.

At this point even Mr. Santayana, who in other respects envisages the situation with remarkable penetration, leaves it unexplained. He speaks of "an exercise of attention or awareness," an "intuition of essences," on the part of the "organic psyche," the "psyche" itself not being described except in physical terms, as the brain-processes concerned. But how can a brain-process conceived in purely physical terms exercise "intuition" or "awareness," either of essences or existences? These terms remain mere words, pointing to the undeniable fact, but failing to make it intelligible. How *can* an organism be aware of this remarkable cinema which some people call a "stream of consciousness," which includes existing and non-existing entities? Any intelligible answer involves a realism as to mental states, as surely as the question how we come to have just such and such sequences in experience demands for its answer a realism as to physical objects.

It surely is not enough to say that sensed color is

a mere essence without existence. If it is a non-existent essence, at least it is an essence *given, appearing* here and now. By what mechanism can a physical body, stimulated by an outer physical object, become aware of this essence, out of the infinite number of essences that might, but do not, become data of consciousness? If our world is intelligible at all, it must be that the brain-process is something more than physical, as that term is commonly understood; it must have a definite nature of such a sort that the appearance of colors is inevitable under the circumstances. Only, I submit, as we admit the existence of *inner* events (*i.e.*, states of the organism), whose characters are, in a sense to be later explained, projected into *outer* existents, can we explain our attribution to those outer objects, in the moment of perception, of the sensible qualities that each of us seems to perceive in them. The particular inner events that play this part in conscious experience I call *mental states.* The bodily organ that has these states, or events, is the *mind.* The abstract nature of these states, that gives the sentient character to conscious experience, I call *psychic.*

CHAPTER VI

THE FUNCTION OF MENTAL STATES IN PERCEPTION

Perceiving, conceiving, remembering are, we have said, a sort of imagining or dreaming. The data which they bring before us may or may not be actual existents; in the case of memory they may or may not be actual past events—the latter case being what we call an illusion of memory. But since all these data are certainly dreamed, imagined, *i.e.*, consciously apprehended, there must exist in each case a set of concrete psychic events. In other words, there is a flux of psychic life, the direct existential basis for the appearance of the various data. This flux of psychic events has its locus, I shall argue, in the brain, and is an integral part of the causal order of nature.

Since man is primarily concerned with the world about him (including his own body), he does not notice this flux of inner events, under ordinary circumstances. Further, it is doubtful if he can ever introspect his mental states at the moment of perceiving outer objects, because the perceptive function and the introspective function are incompatible, inhibiting each other. But in all sorts of indirect ways we can satisfy ourselves that mental states were in existence at the moment of perception.

Take our case of hallucination again. When the patient sees "a red dragon out there," he is attending to the supposed external thing, not to his sensations. But does not the simplest explanation of his mistake lie in saying that he had a complex of vivid sensations at that moment, which he somehow "projected," reacting, that is, as to an outer existent? To suppose that a dragon-shaped patch of red color really exists "out there," as the proponents of the sensum theory must logically suppose, is to make an equally hypothetical assumption, and one whose implications are far more disturbing. The supposition I make is much simpler, as the argument up to this point should make clear.

Take the case of "after-sensations." I look at the sun, and then at a blank wall near by, or a far off cliff. I see a bright disk on the wall or cliff. No one else sees it in either place; a physicist would discover no relevant event there. It has no part in the causal order of events that are going on out there. Is it not simplest, then, to believe that I have a light-sensation at the moment, which I "project" upon whatever surface I am looking at? That is, my sensation *seems* to be out there—the "where" depending upon what I turn my eyes towards. But now, how did I happen to have that vivid sensation at that moment? Is it not because (as the term "after-sensation" implies) I had a similar (and even more vivid) sensation a moment before, when I was looking at the sun, a sensation of which the "after-sensation" is actually the lingering

after-effect? What was present to my mind at the earlier moment was simply "the sun," or "the dazzlingly bright sun;" what is present at the later moment is perhaps "a bright disk out there on that cliff." But in order that these objects might appear to me, may we not assume that I had a complex of mental states, which continued in existence for a short time after the direct ether-vibrations ceased to affect my eyes? When looking at the sun, we "project" our sensations towards the sun, and react as to "a dazzling sun off there;" later, when looking at the cliff, we react as to "a cliff with a bright disk on its surface." But only because we have the sensations to project, *i.e.,* to refer to the external thing upon which our eyes are focused.

Now take the case of the ordinary perception of color. As we have seen, it is extremely difficult to believe, upon mature consideration, that the infinite variety of colors that may be seen by different perceivers exist out there in space at the point upon which all the eyes are focused. On the contrary, the perceived colors, whose character in each case is determined by the perceiving organism, when its appropriate brain-processes are aroused, are far more reasonably believed to be a product, in some sense, of the organism, and to be falsely imputed to the thing toward which the eyes are turned. Common-sense admits that there is such a false imputation or "projection" of the color when we look through colored glasses; and the case of looking through our eyes is not essentially different. Is it

not simpler to believe that there exist so many different mental states, each with its own separate place in the spatio-temporal order (*viz.*, in the brain of its owner), rather than to believe that the colors are all superposed at the same point in outer space, or that each exists in a different spatial realm?

By the same line of argument, we are led to believe that *all* our perceptual data appear to us as the result of a similar "projection" of our mental states into the world about us. But, as we saw in Chapter IV, we have good reason to believe that this imputation of characters to the physical world is veridical, *i.e.*, yields us literal knowledge, in some cases, and not in others The color-qualities are *falsely* imputed, the geometric forms of our perceptual data are *rightly* imputed to the things about us. Perception, and science, give us valid information only of the pattern of things, not of their substance or inner nature. That remains private.

Note then that a perceiver looking at my brain could discover only the arrangement of its parts, not its substance, its inner, private, aspect. But if so, the fact that no outsider peering into my brain would perceive the mental states that exist there when I am perceiving an object does not in the least prove that those mental states do not exist there. The mental aspect is precisely that "private" aspect of my brain-life which is unperceivable, for lack of any mechanism that could make perception of it possible. But we must leave this point to be developed in the following chapter.

Another argument for the existence of mental states lies in the fact that the time of an appearance to consciousness is not the time of the physical event known. This is obviously true in the case of memory, but it is also true in perception, and very noticeable in the case of distant objects. Suppose "that star" to be my present datum, the object of my awareness. The physical star, as has often been pointed out, may have been dissipated into vapor by a collision and have disappeared years ago. What concrete basis, then, in the world of existence has this appearance which is now before my mind? Suppose it is the last instant at which I could perceive the star. Then even the ether-vibration comes to an end as it stimulates my eyes, and by the time I have the star-experience, *nothing* relevant exists outside my body. If we are to understand the existential situation at all, is it not the simplest supposition to hold that a sensation exists *now,* in *me,* which I refer to outer space, instead of treating as something within my body? I refer it to outer space not in subsequent judgment, of course, but in the very moment of perception. The rôle of the sensation in perception is thus not to be the datum of awareness, but to be a sign to the organism of something outside itself; the supposed external existent is what the organism is aware of.

Another illustration of the necessity of assuming the existence of sensations as a part of the existential basis of perception can be drawn from the class of cases in which the physical order of

events is reversed in perception; as when, standing on a distant hilltop, I see a charge of cavalry and later hear the bugle-call that excited the charge. It is not enough to say that the cognitive order may be different from the physical order; that is a true statement, but it merely sets the problem. How *can* it be different? The blast on the trumpet preceded the cavalry charge; my perception of the charge precedes my perception of the bugle-call. Is it not simplest to say that the visual sensation produced in me by the rapid ether-vibration preceded the auditory sensation produced by the earlier-started but slower air-vibration? Each sensation is the existential basis (strictly speaking, a part of the existential basis) of a perception; the time of the two cases of perception is the time of the existence of the two sensations and their respective motor consequences.

As the temporal order of our data may be different from that of the events perceived, so may their spatial order. I see a star in a certain position in the sky with respect to other stars. But the physical star has been moving, during the years required for the ether-vibrations to reach me, and may very well be now in a different position with respect to the other stars from that in which I see it. There may be nothing in that part of the sky where I see the star. But the fact that I see the star there can be explained by saying that a sensation has been produced in me which I refer to the point of space upon which my eyes are focused.

The same explanation can be given of mirror-images. There is nothing of the sort where these images seem to be. But their apparent existence there can be explained by saying that sensations produced in us are "projected" into that space behind the mirror.

In all these cases, we must recognize clearly that a physical explanation of the process by which we come to have certain brain-events and muscular events, rather than others, is not an explanation of how we come to *see* something. This is perhaps more obvious in the cases in which we see something which is not *there;* but, of course, it is not even an explanation of how we come to see what *is* there. For in the latter case the time of seeing is later than the time of the event that is seen, and we need to assume the existence of the mental state at the later moment, to account for the appearance of the visual datum at that moment. But in the former case, not being able, however naïve we are, to suppose that the sensum simply is the surface of the thing seen (because there is no thing there), we *must* suppose that what exists is a mental state, or offer some alternative hypothesis.

The cases of memory and of anticipation even more patently need explanation in terms of mental states existing at the time of the remembering or anticipating. It is a past event that I am remembering or a future event that I am anticipating; *i.e.,* the object of my awareness, my datum, is something past or future. But how can I be aware of it

except as I have present mental states to use for remembering or anticipating?

So when I think of, conceive, imagine, or dream of, things outside the range of my present perception, there must be mental states existing in me now, to make possible the swimming before my mind of these objects. What exists is a complex of revived sensation-elements and a set of bodily adjustments; what is thought of, imagined, dreamed of, is the absent object.

In the case of non-cognitive feeling, or any states of mind that are anoetic, the existence of the mental states is the whole story. This case has little practical significance; but what exists during such moments has the same general psychic nature as the states of our being which, in ordinary experience, are the means for our knowledge of the past and future, of our bodies and the outer world.

If, then, the theory here outlined, and later developed more fully, is true, our own mental states are usually overlooked; we look *from* them, as it were, at physical objects and events. To become aware of our mental states, we must ignore our sense of looking out at outer things. But noting our mental states as such is also a cognitive process, not the mere *life* of our mental states. And because, when we wish to note and report on our mental states, we have to stand off, so to speak, and look at them, we are likely to err in our introspective findings. Even the blind anoetic states would not be *known* to exist simply because they *did*

exist; we have to *note* them. And it is only fleeting echoes of them that we can ever catch. The sensations used in perception can be more easily studied. But it can only be by abandoning the perceptual attitude, recovering "the innocence of the eye," having a somewhat different datum from what we had when we were perceiving the qualities of our supposed outer thing. Hence the nature of the mental state at the moment of ordinary perception can not be directly known, but must be inferred from the nature of the perceptual datum and the nature of the datum introspected (or *inspected*) at another moment.

The evidence for the existence of our own mental states is really on a par with the evidence for the existence of physical things. The starting--point for philosophic reflection is—the data of our experience, the various supposititious objects and events of which we are aware. These data appear to us in certain sequences. In order to explain the fact of experience, and its peculiarities, we accept the realistic hypothesis as to our percepts on the one hand and our mental states on the other. The data of our experience, we then come to see, have no existential status of their own; they are simply assumed entities, the assumption being made by an objectification of our mental states through ensuing motor adjustment. In so far as they are veridical they are the very things about us, or some properties of those things; or, in the case of introspection, the very events of our inner life. It would be pos-

sible merely to stare at the objects of our awareness without taking them as anything but apparitions. But actually we cannot help having faith in existence. To suppose that *all* our data, the infinitely various entities or characters present at one time or other to human consciousness, exist, strains credulity, upon reflection. What we can reasonably believe to exist is, the physical world as science conceives it, the macrocosm, and the microcosmic mental complexes. Granted these existents, our awareness of our (partly illusory) data can be made intelligible.

All realism thus requires faith. But to ask for a faith based upon rational grounds is not to equate all sorts of faith. It is not to ask for a belief on the ground that to believe is pleasant or practically useful; it is not to demand a will to believe. There are many cheap and irrational faiths. But faith itself is not irrational. And surely no other faiths are so clearly justifiable as the realistic faith in the existence of the physical world about us and the existence of our mental life. How these apparently so different realities coexist in nature it will be the function of the following chapter to discuss. And how, in such a world, consciousness arises, the Second Part of this volume will unfold.

CHAPTER VII

THE IDENTIFICATION OF MENTAL WITH CEREBRAL STATES

The existents concerned in perception seem, at this point in our argument, to be three: at the farther and earlier end, the terminus *a quo,* of the physical mechanism of perception is the physical thing perceived, the "objective" of the perception, while at the hither end, the terminus *ad quem,* there are two apparently different sets of existents, the physical processes in the body, and the mental states. There is a causal process connecting the two termini; but its existence is irrelevant for our present problem. When the bodily processes and the mental states are aroused, *perception* of the outer object takes place. But, as we have stated in outline, and shall later explain in detail, this awareness of the outer object does not involve any further existents to complicate the situation. The argument of this chapter will show that the mental states involved in perception are the very substance, or inner nature, of the cerebral events involved, and hence that the situation can be still more simply described as consisting of but two existential factors, the physical thing perceived, on the one hand, and the events, at once psychic and physical, in the perceiving organism, on the other.

The term "physical" and the terms "psychical" and "mental" have, of course, different meanings. But it is not necessary to mean by them two different substances or realms of being. It is possible, and we shall argue that it is appropriate, to apply these terms, respectively, to events as known through perception and studied by the physical sciences, and to events as studied by introspective psychology and known in our ordinary awareness of our mental life. They are not thus made purely epistemological terms, denoting merely two methods of approach; they are metaphysical terms, denoting different aspects of the existents known. Perception and physical science tell us of the order or structure of nature. Introspection gives us, though doubtless in a rough and inadequate way, a sample of its stuff or substance. That the substance of the cerebral events should be psychic, and that they should, nevertheless, have the structure indicated by brain-physiology and physics is not only quite conceivable, it is, I submit, the only intelligible thorough-going solution for the otherwise hopelessly mysterious problem of the relation of the mind to the body.

Our whole argument up to this point has confirmed our view that physical things do not have the sensuous qualities which we seem to perceive in them, but only the *order* that perception reveals. We have no reason to suppose, for example, that the matter composing the brain is, in itself, gray; if a person sees it as gray it is simply because a

sensory event of a certain sort has been produced in him when he looks at it. The information concerning the brain looked at, which is obtained from this perception of color, is information concerning the rate of oscillation of certain electrons within its mass. Similarly, *all* perceptual knowledge of the brain turns out to be simply knowledge concerning the arrangement and movements of its constituent parts. Since, then, perception and physics cannot reveal to us the substantial nature of the brain, but only reveal the *pattern* in which its parts exist in space and time, there is nothing to forbid our believing that its substantial nature is such as we find in introspection. This substantial nature is not perceivable, by an outsider, since there is no mechanism by which it could be perceived. It remains private, known only, if at all, by each individual possessor.

Our view puts mental existence in space. But why not? We have been accustomed to think of sensuous qualities—colors, sounds, etc.—as existing in outer space. Our theory merely locates them in another part of space, *viz.*, in the brain. Or, more exactly, it locates in the brain mental states of such a character as are necessary to account for our seeming to discover those qualities in outer space. For, as we shall presently see, the process of reference to an outer world falsifies to some degree the actual nature of our mental states. We shall try to show in detail that the psychic nature of brain-events is not incompatible with their phy-

sical pattern. They may have all the features which a cautious physicist would attribute to them, and at the same time have the psychic nature which is discoverable by introspection and is necessary to account for the fact of consciousness. For the moment, however, the reader is asked to waive the discussion of this, and to turn to the consideration of the positive arguments that can be offered in favor of our identification of mental with cerebral events.

1. The first fact to note is that *the mental event and the cerebral event concerned in perception are simultaneous.* The neural arc is, apparently, continuous, a chain of events leading from the sense-organs to the muscles. The mental event concerned in perception does not begin until this process reaches the cerebrum. Or rather, the continuous stream of mental events is modified at that moment by the addition of a sensation-element, apparently the effect, as the cerebral event is, of the causal process that started from the outer object. The observed facts suggest that there is a close "correlation" between cerebral events and mental events in every case of conscious experience; *i.e.*, for every variation in the cerebral complex there is a corresponding variation in the mental complex. We cannot measure the time of the beginning of either event to a minute fraction of a second, and it is, therefore, conceivable that the mental event always lags behind its "correlated" cerebral event, and is its *effect.* But there is certainly no positive evi-

dence of this difference in time. What stares us in the face is the apparent, or approximate, simultaneity. In any case, we have regularly a double result when we stimulate the brain—we produce, or alter, a cerebral state and a mental state. Why this duality? Why is cerebral life accompanied so constantly by mental life? Is not this regular synchronism suggestive of a fundamental unity?

2. Note further that *both the cerebral event and the mental event are, in a sense, representative of the thing perceived.* The cerebral processes vary delicately in response to variations in the physical things affecting them. So do the mental states. Because of the concomitant variation with outer objects, the cerebral processes serve to adjust the organism to their varying structure and behavior. There seems to be no reason why brain-processes should not be capable of any degree of subtlety of adjustment; they should need no mental states to eke them out. But here the mental states are, apparently playing an exactly similar part in the game. The mind bears all the marks of being essentially an organ for adjusting the behavior of the body to its environment. Why this duplication of machinery? The suspicion is enhanced that we have here but one adaptive process, known in two ways.

3. The belief in the fundamental unity of the two processes is confirmed by the many facts which show that *whatever alters or extinguishes the one alters or extinguishes the other.* Brain injuries affect the mental life of the patient. Drugs that stimulate or

paralyze the brain-processes stimulate or paralyze mental life. A serious impediment to the growth of the brain results in idiocy. Degeneration of the brain in old age means degeneration of the mental powers. Proper nourishment and rest for the brain are essential for clear and useful mental life. Conversely, active mental life involves the activity of the brain-processes, as can be shown by the fact that to start thinking, even of an abstract sort, after relative mental passivity, immediately draws an increased supply of blood to the brain. All this is intelligible if the two sets of processes are really one. Whereas, if mind is something that exists in a separate realm and only interacts with the brain, we may wonder why in every phase of its life it seems to be bound up with the life of the brain.

4. Indeed, *the peculiarities of minds are, in general, far easier of explanation in physical terms than in terms of our introspective knowledge.* Habit, memory, forgetfulness, and many other features of our mental life are simply ultimates, to be accepted but not explained, so long as we contemplate our mental life introspectively. But as soon as we realize that the "correlated" brain-process is actually the same set of events, we begin to understand them. Habit, for example, results from the fact that cerebral currents follow the channels of least resistance, together with the further fact that each use of a set of channels lowers their resistance, increases their perviousness, relatively to other sets of channels that might be followed. Looked at in

this way, mental habits are explicable—if mental life is really the same thing as cerebral life. If not, there seems to be no way of explaining the facts of mental habit. And the same remark applies to all the peculiarities of our mental life, as a considerable part of this volume will attempt to show.

5. *Our view accepts the fact of the causal efficacy of mental states;* it makes them a part of the very warp and woof of the world's life. Our volitions are indeed the causes of the movements of our bodies; and all our mental life is no less truly, though less dramatically, connected causally with ensuing events. *We* are in the saddle; our plans and desires and fiats help to mould not only the behavior of our bodies, but the world about us. The fact that this is consonant with our instinctive belief and with our desire does not prove that it is the truth. But since on other grounds we are justified in holding to the causal efficacy of mental states (because we see good reasons for identifying them with the brain-processes, which obviously have causal efficacy), it is legitimate to call attention to the fact that this aspect of our theory, like our realistic view of physical things and of mental states, is in agreement with common-sense and our natural instincts.

There is not only something highly unnatural about the denial of efficacy to mental states, but such a view is also in sharp conflict with certain general conclusions drawn from our experience of nature. For one thing, we notice that the process

of biological evolution favors, in the long run, what is useful to organisms; useless features are indeed often produced, but they tend to disappear in the struggle for existence. Is it likely, then, that something as widespread as mental life should have been produced and retained and developed to a high degree of complexity, if it is of no use to organisms? This is not a decisive argument; no one can say *a priori* what irrelevancies and futilities as well as what useful things nature may produce. But it is satisfying to note that our theory is in line with our general observation of the pertinence of the products of evolution.

Further, we have no instance elsewhere of a caused event which does not, in its turn, become a cause. To leave mental states causally inefficacious, produced but producing nothing, would be to give them a status quite out of line with that of any other known existent, and to make impossible a simple and intelligible view of nature. We should have, in these corners of the world, as an inexplicable by-product, something which is not only totally different in kind from the stuff of which everything else is made, but which does not exercise the causal function which every other existent exercises, and is without effect upon succeeding events. Surely this strains credulity.

6. The familiar dualistic, interactionist views[1] agree with our view in allowing mental states causal

[1] See, for examples, Wm. MacDougall's *Body and Mind*, or J. B. Pratt's *Matter and Spirit*.

efficacy; but they leave them homeless and their interaction with the brain a mystery. *Our view alone gives them a locus in the spatio-temporal order of nature,* and thus makes their causal efficacy intelligible. *Where* are the mental existents that the interactionists postulate? They are nowhere in the spatial world, we are told; yet they travel about, in some sense, with the movements of the body to which they belong. They always interact with the right brain, wherever that brain may be. How can we conceive a relation to the brain which is not spatial and yet acts as if it were spatial? *How* do mental states that are nowhere co-operate with the right brain-events to produce the behavior of the organism? How do they know just which molecules to push, and how is the pushing done? The whole situation is left unintelligible and out of line with the rest of our knowledge. All sorts of questions can be raised, and never answered. This does not absolutely disprove the dualistic view, but it gives an enormous advantage to our view, which raises no such apparently unanswerable questions.

7. Our view, unlike the dualistic theories, allows us to accept the great generalizations of natural science which have proved so illuminating and useful—*the doctrine of the conservation of energy, and the dynamical view of nature.* These doctrines are, of course, not provably true; they are to be accepted only as they fit observed facts. But so many facts have been found, on close examination, to lose their exceptional character and to fit into the homo-

geneous pattern which these principles define, that an immense presumption exists that *all* natural phenomena fit into this pattern, a presumption only to be overthrown by evidence to the contrary.

It is not necessary to labor the point that dualistic interactionism involves a break with these doctrines. If mental states are something outside the physical world, they cannot interfere with the behavior of an organism without doing work, without violating the physical laws of the conservation of energy and the laws of motion. Something happens that would not have happened as a result of the physical factors involved.[1] This may, of course, conceivably be the case. But our view, which can accept the great generalizations of physics without reserve (though it is not obliged to accept them, and would not, if any positive evidence against their universality should be found) and at the same time preserve the common-sense belief in the genuine efficacy of our mental life, has the momentum of natural science behind it, as no other view has.

8. Our view is also in harmony with *the principle of continuity.* As we study psychology, reflex actions seem to shade imperceptibly into volitional reactions. But reflex actions are admitted by all to

[1] It may be held that mind merely causes potential energy to be transformed into kinetic energy, or *vice versa,* or merely causes the energy to switch from this channel to that, without altering the sum-total of energy in the system. But I take it that the "law" in question is more than a statistical law. If mind is causally operative, and is non-physical, its operations violate the law *in detail,* if not in the net result. It takes energy to transform, release, or switch energy, if the "law" holds.

be automatic and subject to physical laws. Interactionism implies that there is a point at which the brain-responses cease to be describable in terms of purely physical laws and begin to be affected by events of a totally different order. Our theory, while accepting the fact of mental efficacy, requires no breach in continuity; physical laws hold throughout, the mental events being themselves physical.

Likewise, in considering the historical development of organic behavior, the interactionist postulates a point in time at which the hitherto purely physical events become affected by a non-physical factor, a "soul" or "entelechy," or whatever. Where does this new entity come from? How does it find its way into contact with the molecules of a brain, so as to affect the motor responses of the organism? By contrast, our view involves no break in the continuity of the evolutionary process. As we shall presently see, psychic stuff is the very stuff of which the world is made; and while everything is subject to physical law, everything is made of the very stuff of which we ourselves—with our inner mental being—are composed.

Some of the above advantages could be claimed for one doctrine and some for another. But our view is the only one that has *all* these advantages. It holds to the conservation of energy, and *nevertheless* believes in the causal efficacy of mental life. It holds to the principle of continuity, makes mental states an integral part of nature, *and yet* recog-

nizes fully their psychic nature. Surely this is no mean claim to consideration.

Our view is not a psycho-physical *parallelism,* it is an *identification* of the two sets of events. What differs is not the events themselves, when we consider them as, respectively, physical or mental; what differs is the aspects of the events which we are cognizing. Moreover, according to the analysis made in our opening chapter, our data are not the very realities known, *except in so far as our knowledge is literally correct.* Our question then becomes, How far are our perceptual knowledge, and our introspective knowledge, of these events veridical? When the non-veridical elements have been rejected, are the facts learned from these two sources compatible? If so, the apparent difference between matter and mind is an illusory difference. The facts which we know about matter are a different set of facts from those which we know about mind; but the two sets of facts are simply two aspects of a single set of events. And this is precisely what we shall find, as we proceed. The knowledge got by introspection simply fills in and completes the skeleton-knowledge of events got by perception. By the two cognitive processes we get, not two antithetical realms, as the dualists suppose, but two complementary bodies of knowledge about the One Realm.

CHAPTER VIII

THE SUBSTANCE OF REALITY

In one corner of the world, *viz.*, in my brain, I have a private access to reality. Although I can not introspect my mental states adequately, I can get by introspection a considerable amount of knowledge concerning this elusive cerebral life of mine. An outside perceiver, if he had proper instruments, could study these events in detail. But he would be learning only of their pattern, not of their substance. This spatio-temporal pattern he would call the neural processes in my cerebrum. But he would have no means of discovering the psychic character of the processes, which is their own inner, private nature, or substance.

But now the question arises: If this particular corner of the physical world is made of psychic stuff arranged in a physical pattern, may not the whole world be made of similar stuff? If the psychic character of the elements of our neural processes is compatible with what physics tells us of them, such a psychic character for all matter is compatible with what physics tells us of it. Psychic stuff may be the stuff of which all things are composed. And, indeed, there are strong reasons for supposing this to be the case.

1. *It is the simplest assumption, and the only as-*

sumption that is not purely arbitrary. As we noted in an earlier chapter, physical science can tell us nothing about the stuff of which things are made, it can tell us only of the arrangement of their elements. We have strong reasons for believing that only the form-qualities of our perceptual data are actually properties of the things we are perceiving. But this leaves us without perceptual or scientific knowledge of the *sort of stuff* that is arranged in these intricate patterns. If, then, the clue furnished by our dual knowledge of our own inner life is *not* used as a means of penetrating the inner mystery of matter, we can do nothing but make a quite unwarranted guess at it. Since we know nothing whatever directly of the nature of substance outside the brain, is it not simplest to assume that it is similar to its substance *in* the brain? And its substance there, we saw in the preceding chapter, is *sentience.*

2. *We must accept this assumption if we accept the principle of continuity.* It would make sharply against that principle to suppose an abrupt change in the substance of reality when it assumed the particular pattern of the brain-processes. Brains are made of the materials that make up the rest of the world. Their substance is continually breaking down, passing out of the body, and being replaced by new material composed of the food that the organism has eaten—which is just ordinary matter. Thus the theory that the substance of all things is simply more of the substance that we find revealed in our own life is in line with the apparent con-

tinuity that we find when we study the world in physical terms. It is the only theory that gives us a universe without unintelligible breaches, as well as the only theory that gives us a universe of the nature of whose substance, as a whole, we can have even a rudimentary knowledge.

3. *We must accept this theory if we would explain the origin of minds in a non-mental world.* Brains have developed out of less complexly organized matter by gradual stages; there is no apparent break in physical evolution to suggest that a new sort of substance has appeared, or that the universal substance has acquired a new nature. But if a mind is simply a brain regarded from the inside, so to speak, *i.e.*, with respect to its psychic nature, the gradual evolution of a brain *is* the gradual evolution of a mind. We need to suppose no jumps in the process which has brought into existence human minds. But on the other hand, there is no implication in this that any part of the world outside of living organisms is conscious. Consciousness, as we shall see in Chapter XIV, is a function belonging to an organism not because it differs in substance from the rest of the world, but because of its peculiar relations to other things. These relations result, of course, from the peculiar and complex organization of its neural and reactive mechanism. But the rest of the world, though not conscious, is made of the sort of stuff that could equally well enter into these relations, and thus give rise to consciousness, if, in turn, it were to become a part of

the substance of an organism endowed with sense-organs, reactive mechanism, and brain.

We must now consider what is implied by our theory with respect to the nature and relations of the world-substance.

In the first place, we must make clear that we can accept everything that the physical sciences tell us about the world without reservation or forced interpretation. The term "matter" is colorless, meaning nothing but "the stuff that things are made of," whatever it may turn out to be. The terms "energy," "force," "electricity," etc., point to the same units that make up physical things, but with reference to their behavior—*i.e.*, their redistributions in space and time. So that we are opposing no scientific knowledge, but merely supplementing it, by holding that these units of matter are psychic units. We may none the less continue to call them electrons, protons, or whatever science calls them.

Time and space are undoubtedly genuine aspects of reality; that is of the essence of realism. It takes time for a far-off event to affect me, a time proportionate to its distance in space from me. So the units that make up my mental states are in space and time—the space and time of the cerebral processes whose inner being they are. The mental states that enable me to be conscious of anything are composed of vast numbers of these units—electrons, protons, ether-particles, or whatever the ultimate units may be called, in physical terms. They

must, therefore, have size, shape, and location. Is this compatible with our introspective knowledge?

Introspection certainly does not discover that our mental complexes do *not* have size, shape, and location. On the contrary, it can often tell us something of their relative size and shape, though it can not tell us anything as to their location.

Sometimes our mental life consists of a meager trickle, at other times it is voluminous. All sensations have some degree of "extensity"—which must depend upon the *size* of the area excited. In the case of visual and tactile sensations, we can judge pretty accurately of the relative size of the sensory areas functioning. If, for example, we survey a landscape, and then, looking through a tiny hole in a black box, see only a part of that landscape, there can be no doubt that the events in the visual area of the cortex cover a correspondingly smaller area than when the eyes were unhampered. Again, when we hold up a hand so as just to cover from our sight a distant object, we may infer that the size of the visual area concerned remains approximately the same. Of course, the events in the visual or tactile area are never more than a fraction of the total network of cerebral events involved in a perception. At best, such introspective knowledge as we have just mentioned is only knowledge of the relative size of various similar psychic complexes, telling us not only nothing of the size of these psychic complexes, or of the total cerebral process of the moment, as compared with the size of an ex-

ternal thing perceived, but nothing even of the relative size of different sorts of psychic complexes, as, a visual and an auditory complex. Any such knowledge we must get from brain-physiology.

In the case of visual and tactile complexes introspection can tell us something of their *shape*. Because of the essentially projective nature of consciousness—to be presently discussed—we are continually perceiving the size and shape of outer things, rather than of our inner states. But it is evident that the retina, like the sensitive plate of a camera, reproduces the shape, in two dimensions, of the objects from which it receives light, and that the visual area of the cortex to some degree reproduces this shape. The events excited in that area may in their contour and orientation differ widely from the outer object; but there must be a concomitant variation between the two shapes if the visual states are to guide the body with reference to the object. Adjacent points in the object will be represented by adjacent visual events in the cortex; a spot in the object where a different sort of electronic oscillation or orbital change is taking place from the sort going on in the rest of the object will be represented by a spot in the visual area where a different sort of event is taking place; otherwise we should not see the spot in the object as of a different color. So the different shapes of our sensation-complexes, though ordinarily used by us as signs of the different shapes of outer objects, can be studied in themselves; as when we cease perceiv-

ing a round coin and notice the elliptical shape of our datum. And the same thing is true of our tactile complexes.

As to the location of our mental states, introspection can tell us nothing. Whenever we discount the essentially projective nature of consciousness, we are left with "floating" mental states, and have no way of knowing introspectively where in the physical world they belong. Hence the prevalence of dualistic philosophies. But our inability to discover their location introspectively is merely due to the inadequacy of our introspective machinery.

We must be quite clear about the difference between the existence of psychic stuff and *awareness,* which is cognition. The units which make up our mental states and the rest of the universe, are not *aware* of anything—neither of anything else nor of themselves. They just *exist.* The members of a group do not know themselves to be members of a group. The fact of their constituting a group of units that function together, or the fact of their being in such and such a position in space and time, is a fact *about* them, not an aspect of their psychic being.

There is no way in which anything can be aware of anything, except as a subtle and complicated mechanism, such as an organic body, permits certain limited cognitive relations to come into being. It is the *organism* that is aware (or conscious) not the units. Awareness (or consciousness) is a very special function, to be sharply distinguished from the

mere psychic nature of existence—though the latter is a *sine qua non* of the former. And since the function of awareness has been developed primarily, like every other product of organic evolution, because of its usefulness to the organism, it is not surprising that we have developed no means of introspective awareness of the location of our mental states—a sort of knowledge which would be of no use to the organism.

It would be wrong to use the terms "mental" or "feeling" to denote the stuff of which things are made. For all our mental states, all our introspectable sensations and "feelings," are highly particularized aggregations of enormous numbers of the ultimate units. The structure of reality, as we learn of it in physics, is almost incredibly complex, and its fine parts almost incredibly minute. That is to say, our human life is lived on a scale that is, by comparison with the scale of electrons and protons and ether-vibrations, like the sweep of the Milky Way compared to the size of our planet. Consciousness is a function of the relation between groups of myriads of units. It is thus of comparatively little importance to physiological psychology, as it is of comparatively little importance to such a science as geology, to attain to a clear conception of the ultimate units of existence. Certainly introspection is far too gross a process for that. What we can hope to do, however, is to develop a chemistry and physiology of brain-processes. We should like to know, for example, the exact physical and

chemical differences between the events which take place in the visual area and those that take place in the auditory area of the cortex. We should like to know in exact detail the complexities of the neural process that is the existential ground of this or that specific form of consciousness. Such knowledge may be gained if it ever is feasible to carry on appropriate experiments with the brain-processes of intelligent human beings. From the physical side our knowledge might become very detailed, even to the motions of the constituent electrons and protons. But our *introspective* knowledge could only refer to relatively large masses. All we can say is, negatively, that it is illegitimate to read into the units such characters as belong to thought, sensation, emotion, or will, which are highly particularized processes belonging to the life of an organism with a developed brain. The term "panpsychism" may properly be applied to our theory; but we must understand that it is only mind-*stuff* that is universal, not mind itself. The attribution of quasi-human forms of consciousness to the inorganic world is poetic and fanciful, not at all an implication of our view.

The whole world is indeed, in a sense, alive. But it does not know itself to be alive. It is an enormously intricate pattern of psychic units, continually changing their interrelations. But these units have no way of knowing anything of the pattern or the change. They are, perhaps, all alike; that seems to be the conception towards which physics is tend-

ing. If this is so, it is only the ceaselessly varying patterns that are different, not the units themselves. The perpetual tendency to change, the resistless push forward, of nature, is the fact designated by the term "force." The regularity of type of these changes is what leads us to speak of "natural law"—a "law" being a formula that expresses one of these types of change. But our doctrine necessitates no choice among various conceptions that physicists offer us of the ultimate constitution of the universe. It is compatible with a variety of alternative conceptions. What is necessary to remember is merely that in any case physics is telling us nothing about the nature of the *substance* of its units, whatever it calls them. We are therefore free to believe that the *stuff* that is deployed in this or that order throughout the universe is the same sort of stuff that composes *us,* sentient beings that we are. Introspection is far from being able to penetrate to the ultimate units that compose the mental complexes that are its objects, or to give us more than an abstract conception of their nature. Such an abstract term for their nature is our word "psychic."

Our theory, then, gives little added illumination to our knowledge of nature. But it does assert our thoroughgoing kinship with all the rest of the natural world. It puts an end to the need of introducing such magical entities as "souls" or "entelechies," and (as we shall see) explains consciousness in natural terms. It enables us to explain the

origin of minds in a non-mental world, and to conceive of all existence as a single spatio-temporal order. It enables us to see *how* matter affects mind, and how mind affects matter. All of this, however, has been only foreshadowed in this Part of our volume; it will be clearer when we have considered in detail the nature of mind. This will be the task of the Second Part of our undertaking.

PART TWO—MIND

CHAPTER IX

PSYCHIC FUSION

In the First Part of this volume we gave reasons for our belief in the existence of the physical world revealed by science; and we identified minds with particular portions of that world, *viz.*, with the cerebral mechanisms that serve to adjust organisms to their environment. In this Second Part of our undertaking we must describe more exactly the nature of minds and show how consciousness arises.

An initial difficulty, which we shall face in this chapter, is this: our mental life, as introspectively known, seems far too simple to be the inner, or substantial, aspect of anything so complex as any cerebral process must be. All such processes would be shown by physics to be composed of innumerable units, moving at very great speeds, and forming a maze of events of enormous intricacy. If our mental life is really composed of these innumerable minute events, why does it seem so relatively simple?

The answer is that our mental life is really as complex as this. It seems relatively simple because we have no cognitive machinery capable of knowing the minute events. They are and are gone in a minute fraction of a second. But they are not known, reported, described, or remembered. It is a

grave error to suppose that *esse* is *percipi,* even in the case of our mental (*i.e.,* cerebral) events. No outward event is perceived, and no cerebral event is known introspectively, except as a cognitive process occurs. And cognitive processes are a very special sort of process, not at all a necessary or universal accompaniment of mental life. The greater part of our cerebral life passes on unheeded, real while it lasts, and causally effective, but not attended to, not arousing any awareness of itself. The minute parts of even those events of which we are aware, while causally effective in their minute degree, and as real as anything can be for the infinitesimal fraction of a second during which they exist, are not apprehended individually, for lack of any means of apprehending them, but are only apprehended as totals. Our processes of attention and discrimination, in introspection as well as in perception, are gross processes, capable of dealing only with masses of co-operating elements. Our reaction, and hence our awareness, is different if the details are of a different sort. But the details themselves are lost in the total, which alone is noticed and reported.

It must be clearly realized that what is simple is not the existent reality, the complex of psychic events, but the datum of awareness, the third category which we distinguished in our opening chapter. Our data, we there said, are simply the objects to which we react, and which we thereby know (for all knowledge, even the simplest awareness, is based

upon reaction), clothed in the characters we impute to them in the moment of awareness. These characters are *presumptively* objective, *i.e.*, we take them as objective, prior to reflection. But only as our knowledge is veridical are they really characters of the objects known; and in considerable degree they are falsely imputed. This is true even in normal perception and introspection, and in those further processes of analysis and discrimination that refine our knowledge both of the outer world and of our inner states. And one of the normal falsifications made by these cognitive acts is the simplicity which they attribute to the thing known. The green surface of a lawn, the blue expanse of the sky, the emotion of anger which we discover in ourselves, all these and most of our other objects of knowledge are really totals of enormous complexity. But the datum of our experience is relatively very simple, for the reason that we have no way of reacting to the fine texture of the reality; we react to these complexes as wholes.

This is clearly to our advantage—except as scientists, psychologists, or philosophers. What concerns the organism is the gross behavior of those groups of units that we call physical things. And so far as we are concerned with our inner life, it is, again, the totals, rather than the innumerable and fugitive minute events, that are of importance to us. Such mass-events may continue for a considerable time, as a practically unchanging whole; they are our sensations, emotions, etc. Bodily reaction takes too

much time, it is too large-scale an event, to base itself upon anything smaller than these relatively large and lasting events, whether inside or outside the organism. Finer reaction-tendencies, and thus finer conscious discriminations, would only bewilder us and block effective action. Hence they have not been developed by the evolutionary process. And we are left with only highly elaborate indirect means, invented by scientists, for discovering the fine texture of reality, whether in our own life or in that of the outer world.

Discrimination means reacting to a part only of a mass-event that has been reacted to as a whole. We can usually thus become aware of parts in what was for us a simple object. But this process of discrimination can go only so far as our reactive machinery allows. The finest part discriminated consists still of multitudinous undiscriminated elements, temporal and spatial.

Sometimes we realize vaguely that an object is complex, even when we are not aware of separately attending to its parts—as when we gaze upon a landscape, seeing it as a whole. But in such cases there are simultaneously initiated a number of discriminatory motor responses, which may remain incipient and produce no overt movement of the body, but which may at any moment become so strengthened as to produce a fully conscious, rather than dimly conscious, awareness of the parts. In such cases our data of consciousness are usually simpler than we suppose. We know that we *could*

discriminate many separate items in the landscape; we know that these multitudinous *things* exist out there, and are affecting our eyes and brain, and that separate awareness of them is at any moment possible. But for the most part the landscape is actually a blur to us, a dim background out of which emerge into separateness those items which it is of practical importance for us to deal with separately, or which attract our attention because of their central position, or vividness, or some other reason. Thus indiscrimination is the rule for the great mass of elements in any complex datum, with explicit awareness shifting from part to part with the shift in energy of our various discriminatory incipient motor responses.

We have many familiar instances of this pseudo-simplicity of our data. When a wheel revolves beyond a certain rate of speed, instead of seeing the separate spokes in their various positions (as we may say, in a sense, that our *eyes* and *brain* see them) we see an apparently motionless disk. In perceiving any movement, such as that of a man running, or a bird flying, we get a simple picture, and are unable to recognize that we have seen the man, or the bird, in the various postures that the camera reveals. So the extremely complex pattern of sounds proceeding from a symphony orchestra may give us the consciousness of a relatively simple melody, in which the different sounds of the many instruments are lost, as well as many of the notes that compose together the peculiar

effect of this particular harmonized melody. In reading a book rapidly we are not conscious of the innumerable words—or letters—that impress our eyes and brains, but only of the total meaning of the passage read. In all these cases, and many others that we might note, the psycho-cerebral complex is obviously very intricate, but the reaction is relatively simple; and we are aware of as a unit what we react to as a unit.

Now this process, taking place on a relatively large scale, and before our eyes, as it were, is exactly the process whereby the still minuter parts of reality are hidden from us. If perception and introspection fail to report even these larger parts in a complex experience, they are *a fortiori* unable to discover the finer parts. Psychologists commonly employ the term *fusion* to cover recognized cases of this process. Hence, I have chosen to retain this term to cover also the deeper-lying synoptic processes because of which the minuter elements of our mental life are never known, or used for the knowledge of outer objects, except *en masse.* It is the same process, apparently, that M. Bergson calls *contraction* and *condensation,* Mr. Balfour *compression,* Mr. Norman Kemp Smith *simplification,* Mr. Holt *combination,* Mr. Strong *confusion* and *summation.* Spencer long ago called it *integration.*

Whichever of these terms is preferred, it must be clearly realized that the events known, whether in perception or introspection, are not *done anything*

to by the synoptic process. They are not affected by being known, and remain multitudinous. And the cerebral events which initiate our responses remain multitudinous. The fusion, or summation, is merely a name for the fact that the datum is relatively simple. And it is simple because (or rather, in so far as) the adjustment of the organism is a single, integrated reaction initiated by the cerebral complex as a whole instead of being a set of separate reactions initiated by the various cerebral events. The contraction, or compression, is therefore merely cognitive, not existential. This will be clearer when we have discussed the nature of consciousness. It must suffice here to say that there is no need to make a mystery of fusion, to speak of "mental chemistry," or to posit a "soul," or "spirit"—as M. Bergson does, for example—to explain what happens. These "souls," or "spirits," moreover, seem, so far, to explain nothing; they are mere names offered in place of an explanation. But the whole matter is explicable in terms of the sensori-motor psychology already adopted by leading psychologists, when taken together with our identification of mental with cerebral complexes, which—as we shall presently see—makes of the sensori-motor situation a conscious situation.

All perception involves the "fusion" of a great number of sensory events. In visual perception we have our color-sensations (which are doubtless composed, in most cases, of several elementary color-sensations), we have kinesthetic sensations coming

from the eyeball movements, actual and tentative, we have sensations of accommodation and convergence, we have the image-elements excited centrally, and the kinesthetic sensations of the tentative or overt bodily movements which the sight of the object provokes. Yet our datum is usually a relatively simple thing; we are not in the least aware of all this psycho-cerebral machinery which is necessary for its appearance. Clearly the simplicity is in the report; we react as to a single object. But the mental states involved are very numerous, and of several radically different sorts. *They* do not get compressed, they simply do not get reacted to and known individually. The fusion is in the realm of appearance—the realm of the data of consciousness; it results from the fact that the body adjusts itself to a simple outer object, ignoring the multitudinous cerebral elements which, working together, excited just that particular motor response.

Consider, likewise, that noises are compounds of different tones jumbled together inharmonically, and that "clangs"—the simple sounds of a musical instrument or of the singing voice—are compounds of different tones harmonically related. The beauty of clangs and of chords is due, doubtless, to the degree of fusion of their fundamentals and overtones, the more complete fusions resulting from a more completely unitary reaction—which, other things equal, makes for greater enjoyment.

Many psychologists, of course, have considered the problem of the analysis of sensations. Mr. Holt

sums up the views of several whom he quotes, in the following words (*The New Realism,* p. 335): "We have innumerable conscious units, phenomenally considered, which at first sight seem as simple as colors or musical chords, but for which we know that the physiological apparatus of production involves a variety of different senses. . . . The number of such seemingly simple, yet physiologically complicated, sensations is beyond reckoning."

The fact is that in nearly all the data of our experience analysis can discover many elements, of which we were not separately aware when they were present as a whole to consciousness. These elements were not features of the original data, for a datum is just what it seems to be;—it is precisely "what appears" that we *call* the datum. But in both cases multitudinous psychic states were in existence, which in the first case gave rise to a single, integrated reaction, and in the second case to a number of separate discriminatory reactions. We call this latter set of processes, loosely, the process of analysing the original datum, and say that the appearance of that datum was a case of "fusion." Moreover, in addition to such analysis, there are other witnesses to the existence of the multitudinous psychic states as factors co-operating to produce the particular datum of which we are aware.

For example, we may be quite unaware of the presence of a sound, or of a tactile or visual sensation, in the experience of a given moment, and yet

become immediately conscious of its disappearance. The *total-impression,* the datum present to consciousness, was altered because of the cessation of one of the simultaneous sets of psychic events; and that alteration attracted attention, which had not hitherto been aroused by that particular set of events.

On other occasions the alteration of our datum proceeds so insensibly that we are unaware of it until, suddenly, we wake up to realize that a considerable change has occurred; as when dusk creeps over the landscape, or hunger or thirst develops, or our mood changes from gay to sad, or from angry to calm. The minute changes in the cerebral factors involved were insufficient to produce a change in the bodily reaction, and so awareness of a difference, until their cumulative effect presently tipped the scales in the direction of some readjustment.

Many physical stimuli are constantly sending messages to our brains. The processes there produced *may* be isolated from that unitary psychoneural arc, connected with a unitary movement-system, which makes possible the unitary consciousness of the moment. But owing to the strong tendency toward unification of the cerebral processes—to be discussed later—the likelihood is that these processes are joining forces with the main current of cerebral processes, and having their share in directing them. Attention directed specifically to them (or to the outer objects which caused them) may well heighten them and make their influence

far greater than before they were attended to. But there they were, all the time, in the background, contributing elements to the total *feel* of the moment. We quite fail to realize, ordinarily, what a difference to our happiness and usefulness is made by these unrecognized elements in the background of consciousness.

For example, there are many after-sensations mingling unobtrusively with the more vivid elements, and sometimes adding an important touch, as in the case of the enjoyment of music. Then, primary memory means a continual "hang-over" of the past into the present, though our forward-looking life usually ignores it. Add to this our persistent but sub-conscious fears, angers, suspicions, jealousies, and the like; our persistent memories, cravings and appetites; the kinesthetic sensations pouring in from all over our body reporting our posture, and from the great number of tentative movements which accompany all perception and all thinking and imagining; the systemic sensations coming from good or bad digestion, heart action, etc., which make up our feeling of bodily well-being or discomfort. Then there are the unnoticed sensations of sunshine and shadow, of humidity or dryness, unnoticed (because irrelevant) noises, and the like. They fuse with the more vivid elements, constantly dragging our reactions this way or that, making us more or less efficient, more or less poised, more or less comfortable or gay, as the case may be.

If, then, many or all of our apparently simple data

of awareness are obviously "fusions", *i.e.*, are the result of unitary reactions incited by very complex psycho-neural processes, it is an irresistible inference—quite apart from the needs of our theory—that the complexity is far more intricate than we can discover by our processes of analysis and discrimination. The fact seems to be, that we can analyse our mental complexes easily or with difficulty in proportion as we have been accustomed to deal separately with their elements on other occasions. Where groups of elements have never been reacted to separately, it is far harder to make the introspective analysis. For example, the trained musician can analyse the note of a violin into fundamental and overtones, and actually hear many of these tones separately, by different acts of attention; whereas the listener who knows little of music can hear only the total, the clang, as a unit. Individuals vary greatly in their powers of introspective analysis, some having finer powers of discrimination, *i.e.*, of separate acts of attention. But in general, *like* sensations fuse *hard* (*i.e.*, are discriminated with difficulty, if at all), whereas compounds formed of dissimilar sensations can more readily be analysed. This is doubtless because the spatial separateness in the brain of unlike sensations makes separate reaction more likely than to closely adjacent sensations. Thus the different gross factors in visual perception, the visual, mnemic, and kinesthetic factors, can to some extent be discovered by anybody, with a little training; whereas the dif-

ferent sensations that go to make up a simple tone or an odor are beyond our reach—we have no discriminatory machinery for isolating and attending to them.

Holding fast to this fact, that the *existence* of complexity and the *discovery* of complexity are far from being the same thing, there is no bar to the belief that mental events are as complex as physics shows neural events to be, and hence, in so far, to the belief that both sets of events are one and the same.

CHAPTER X

THE GENESIS OF QUALITIES

We are now ready to face squarely the objection to our doctrine which critics are likely to consider most serious. It may be stated as follows. The physical world seems, in the light of modern science, to be composed of a single homogeneous substance, rather than of a variety of different substances. To be sure, the analysis of the moment has not penetrated below the unreconciled duality of protons and electrons, positive and negative electricity, with the omnipresence of the surrounding ether an additional, if vaguely apprehended, reality. But there seems to be something arbitrary about this duality, or trinity; and one who has followed the march of discovery cannot help expecting that the future will show—if appropriate experiments can be devised—that it resolves ultimately into a unisubstantial world of ether-particles or etherial motions. Even if this be not the case, however, the differences between protons and electrons and ether will be stated in terms of differing size, structure, mass, or behavior. The heterogeneity of the world of physical science is a heterogeneity of pattern, not of substance. And this is true, of course, of the cerebral processes as well as of every other complex of physical events. Nowhere does physics find anything

like the colorful world that consciousness presents. Differences that appear to us in perception or introspection as *qualitative,* appear to us in physics as *quantitative.* Can these two kinds of knowledge be reconciled?

The clue to this situation lies in what we said in the preceding chapter. The qualities that appear to consciousness are not existentially real; they are a "fusion" for awareness of a spatio-temporal mental complex—whether that complex is attended to in itself, as in introspection, or is used as a means of knowledge of some outer object, as in perception. In either case we do not apprehend separately the ingredients of the complex, except as in some measure they evoke separate reactions. Each different sort of complex that can evoke a separate reaction becomes thereby the basis for the awareness of a different "quality."

Qualities are thus simplifications for awareness, in which the separate items are lost, because too minute, individually, to produce separate reactions. Every case of consciousness is like the distant view of a forest, in which the trees are not seen separately, still less the leaves and their fine markings; the shape and color seen are totals in which the details are lost. Just as the "forest seen from a distance" is a unique datum of experience, with its own peculiar qualitative character, although a nearer approach would yield data full of details quite different from the mass-effect, so *every* datum of experience has a qualitative character of its own,

which is a mass-effect, different from the qualities which would appear if the object known could be analysed and known in detail. It is legitimate, therefore, to suppose that if we could analyze far enough down to cognize the ultimate units, we should cease to have different qualities given, and should apprehend the simple and perhaps uniform character of the units which arrange and rearrange themselves to make up all things.

Our cerebral complexes are of a very great variety, since the nerve-currents in the different cerebral areas doubtless involve many specific modes of chemical and electrical processes, and their possible combinations are practically endless. *Spatially* these "constellations" of psycho-neural events vary from moment to moment. And *temporally* their various ingredients doubtless vary greatly, the number of electronic oscillations or nerve-pulses per second differing from cerebral event to cerebral event. It is these temporal differences that impress M. Bergson; and although his theory differs in very important respects from ours, he may fairly be quoted as agreeing to the point that I am now trying to make clear, as, for example, in the following passages: "The qualitative heterogeneity of our successive perceptions of the universe result from the fact that each, in itself, extends over a certain depth of duration, and that memory condenses in each an enormous multiplicity of vibrations which appear to us all at once, although they are successive." "May we not conceive, for instance, that the irreducibility

of two perceived colours is due mainly to the narrow duration into which are contracted the billions of vibrations which they execute in one of our moments? If we could stretch out this duration, that is to say, live it at a slower rhythm, should we not, as the rhythm slowed down, see these colours pale and lengthen into successive impressions, still coloured, no doubt, but nearer and nearer to coincidence with pure vibrations?" (*Matter and Memory*, pp. 76 and 268.)

M. Bergson's explanation of how this process of condensation takes place seems to me magical, or merely verbal. But he deserves to be cited as one of a number of conspicuous thinkers who hold that qualitative heterogeneity is reducible to quantitative differences. Mr. Holt is another ardent defender of this doctrine, and his discussion in *The New Realism* (pp. 330-352) adduces the authority of a number of well-known psychologists. One of Holt's strongest arguments, for which he gives credit to Brentano and Münsterberg, is that the fact of degrees of similarity between qualities implies that the qualities are compounds of simpler ingredients mixed in different proportions.

"Thus in the spectral series of colors, every hue has a position intrinsic to itself by virtue of its similarity to the adjacent hues: a particular orange has no place in the series except just between a certain yellowish red on the one side and a certain reddish yellow on the other side. . . . One *can* place orange *in space* among the reddish purples, but it hits back at one because the spatial order has been made discrepant with the 'intrinsic', logical color

order. The case is the same with grays, with auditory pitches and timbres, with warmth and cold sensations, to some extent (which increases with careful study) with tastes and odors: the same thing is true of all intensities in whatever field of sensation. Now why, asks Brentano, is this relation of similarity so rigid and inexorable?" The answer must lie in "some quantitative resolution of these qualitative relations of similarity." "No quality which has intrinsically a position between two other qualities can be simple. It must rather be a compound of the qualities between which it so obviously lies. . . . Qualitative 'similarity' is never an ultimate category" (pp. 331-337).

Mr. Holt advances various other arguments.

"There seem to be," he says, "no reasons of a general nature why we should not hope to reduce by analysis all of the conscious qualities to different forms of organization of one sort of element" (p. 340), and concludes, "I hold it, then, to be a view which is amply supported by facts, that the secondary qualities, instead of being unanalysable psychological elements, are all form-qualities of which the time-sense is inadequate to perceiving the form" (p. 349).

It is a striking fact that men of such different philosophies as M. Bergson, Mr. Holt, Mr. Strong, Mr. N. K. Smith, and others whom one might mention, should agree in this view. But none of them except Mr. Strong seems to me to have a glimmer of an idea *how* this summation takes place for awareness.[1] Mr. Holt's statements, while accepting the fact, seem to me to ignore the problem. "A

[1] Cf. *The Origin of Consciousness*, pp. 316-317: "The quality attaching [in introspection] to the psychic state is only a vague impression of the arrangement or complication of the minute parts." Thus "the sensible qualities are not ultimate." On this point, see also two forthcoming articles by Mr. Strong in *Mind*, on "The Genesis of Appearances."

quality may seem as unitary as possible, and may nevertheless *be,* still merely as a conscious phenomenon, complex'' (p. 332). But it is *not* complex *as a conscious phenomenon.* Such a datum as ''a tiny spot of red,'' or ''the simple tone A'' (as given by a tuning fork), is ''a simple quality;'' the complexity is not in the datum, it is in the existential basis of the datum. So I must protest when he says that ''the roughness quality *is* precisely this frequency magnitude [of the nerve-impulse] with the time element specifically omitted from consciousness'' (p. 384). The term ''roughness'' means something other than a certain frequency magnitude of a nerve-impulse.

Two steps seem to be necessary—and sufficient—if we are to *explain* the appearance of simple data to consciousness. First, we must admit that the units which make up the complex which is apprehended as simple, in introspection, or used as a means for such apprehension in perception, are ''psychic''—*i.e.,* are units of sentience. Out of atoms or electrons conceived as the materialists conceive them we could never get a complex that would evoke awareness of a sensuous quality. The dualists are right in opposing the materialistic realists and preferring their conception, mythological as it seems, of a ''soul,'' or an ''awareness,'' separate from matter—something, however vaguely conceived, to bring in the fact of sentience. But why not do away with such a *deus ex machina,* and suppose that the units of matter involved are them-

selves units of sentience? Then the question is, How is the "condensation" or "contraction" effected? Existentially, there are a multitude of events; cognitively, there is a simple quality.

We must then take our second step, which is to recognize the rôle that the motor adjustment plays in conditioning consciousness. The multitude of cerebral events are not themselves condensed. Rather, they give rise to a unitary motor response. They are too minute and rapid to initiate separate responses; hence, they can not, individually, be either described or remembered. But what we cannot describe or remember we do not know. Memory and report work on a far larger scale. They seize the events as wholes, losing all the details and preserving only the mass-effects.

To a considerable extent we can analyse our sense-qualities. But it is not the datum of consciousness, as such, that is analysed. Each quality is *sui generis,* and can only be called similar to other qualities. But the appearance to consciousness of each quality is dependent upon the existence of a specific cerebral complex; and when certain factors only in that complex evoke the reaction of attention, we are said to analyse the quality. The qualities apprehended when certain factors only evoke the reaction will be different from the quality apprehended when the whole complex evokes it.

The contention that some "qualities," at least, are, in the sense in which the term has been defined, "mass-effects," is definitely provable by simple ex-

periments. For example, a plaid of red and blue squares may be held at such a distance from the eyes that it may be seen as a plaid of red and blue qualities, or it may be seen as having, as a whole, the quality "purple." There is a different motor response of the organism in the two cases. The responses are all, themselves, complex "movement-systems," and it is for psychologists to determine in detail what the differences between them are—a fruitful job for the behaviorists. And, of course, every alteration in motor response implies an alteration in the cerebral complex produced by the altered kinesthetic sensations.

The case of purple is worth lingering on, as an illustration of the various ways in which "simple qualities" may be engendered. First, as we have suggested, by carrying away from the eyes a plaid of red and blue squares until the areas of blue-sensation and red-sensation become too small to evoke separate responses, the response becomes a joint response to both sets of squares, and this situation gives us awareness of "purple."

Similarly, when blue and red color-sectors on a wheel are whirled rapidly enough, the data "blue" and "red" are supplanted by a single datum, "purple." In this case the separate blue- and red-sensory events last too short a time to produce separate reactions; our motor responses can not follow one another so rapidly. Or these sensory events persist, in the shape of "after-sensations" or primary memory, during the minute intervals when

they are not being excited from without, so that the situation is almost identical, sensationally, with that described in the preceding paragraph—minute adjacent areas of simultaneously existing blue- and red-sensory events producing a joint motor response.

When a blue patch is presented to one eye and a red patch to the other eye, simultaneously, the usual result is that one of the two sensory areas produces the motor response, and we see one of the two colors alone. The sensory excitement in the other hemisphere is able to produce no response, and consequently evokes no consciousness. But it sometimes happens that the two sensory areas co-operate to produce a joint motor response, and the result is like that in the preceding examples, an awareness of purple.

In all these cases the *eyes* may be said (in a sense) to see blue and red, in adjacent spots, or in turn, or one blue and the other red. Hence the messages to the brain are of the one sort or the other, and the immediate brain-effects are (in a sense) blue- and red-sensory events, not purple-sensory events. The datum "purple" appears only when the joint reaction is produced; it is always a result of the complex. Yet it seems as "simple" a quality as red or blue. If, however, the blue-sensory events are extensive enough in area, and long-lived enough, to evoke a reaction of their own, the datum "blue" is apprehended.

But we must remember that the blue-sensory

event, with its motor response (without which it does not evoke consciousness), is itself enormously complex, composed of myriads of atomic and electronic events. So the datum "blue," "simple" quality though it is, is just as truly as the datum "purple" a mass-effect. *All* the data of consciousness are mass-effects, products of "fusion." "Simple" qualities are those which we are unable to analyze into separate ingredients. But the inability to analyze merely reveals an inadequacy in our reactive mechanism, which is on too large a scale to respond to the details of the sensory complexes. Remember that for generations men believed in the ultimate nature of the difference between the various chemical "elements." Now we know that they are so many differing complexes of protons and electrons. So the elements of our mental life are complexes of psychic units—which are just protons and electrons (or whatever the ultimate physical units are), considered in their substantial nature.

The case of auditory sensations is clearly analogous to that of colors. A simple note sounded on a violin is, physically, a compound of many sets of vibrations. These produce a similarly complex effect in the ears and brain. The trained observer can analyse this complex to a degree, and attend to the "fundamental" or to one or another of the "overtones" separately. But for the unanalytic listener the datum that appears is an apparently simple quality, the note played with the peculiar

timbre of the violin. So long as the complex of sensory elements produces a unitary motor response, the note is heard as a simple quality. Only as separate reactions arise to the groups of sensory elements representing the overtones, do we become conscious of these overtones, with their very different qualities.

But "simple tones" themselves, such as are produced by a tuning-fork, are, of course, represented in the brain by a multitude of minute events, molecular, atomic, or electronic, of which the "simple tone" is a "fusion." We can witness the genesis of a tone-quality in a manner similar to that in which we can witness the genesis of a color-quality. A revolving wheel can be made to produce a series of successive clicks; when the wheel is revolved faster and faster the sound of the successive clicks gradually passes into a musical tone, and the pitch of the tone rises with the speed of revolution. This plainly shows that when our brains can no longer work fast enough to produce a separate reaction to each click, the reaction has to be to a series of clicks; and it is the mass-effect of the series of clicks that is the musical tone—the faster the succession of clicks, the higher the pitch of the tone. A simple tone is thus proved to be a datum based existentially upon a temporally complex sensory event.

A similar illustration can be given in the case of the datum "tactual roughness," which comes to consciousness when a series of taps on the skin be-

comes too rapid to evoke reaction to the individual taps. "Tactual roughness" is a mass-effect.

It is well known that most concrete tastes and odors are, existentially, compounds of several separate sensory events; and of course even the elementary sensory events of which they are composed are themselves highly complex physical events. Yet each taste and odor has, for ordinary awareness, its own specific quality. The taste of lemonade, for example, is based upon the existence of a sweet-sensation, a sour-sensation, a lemon-odor (itself doubtless complex), a feeling of wetness, and a feeling of coldness. These ingredient sensations can be analyzed out by attending to them separately —*i.e.*, allowing each to evoke its specific reaction. But the ordinary unanalytic lemonade-drinker is aware merely of the quality "the taste of lemonade," which is quite *sui generis*.

Emotions are certainly fusions for awareness of a great number of kinesthetic and organic sensations, together with associated memory images and ideas; yet each emotion has its own peculiar character, different from that of any of its ingredients. When it is analyzed into its elements, the awareness of the emotion as a whole vanishes; in so far, for example, as we attend to our rapid breathing and heart-beats, the tension in our muscles, etc., we cease, for the time being, to be aware of ourselves as *angry*. The emotion of anger is a mass-effect.

This conception of qualities as mass-effects, sim-

plified summations for awareness of innumerable sensory details, enables us to see how the awareness of the manifold qualities of our experience can have arisen by differentiation out of the awareness of the few simple qualities apprehended by primitive organisms. With every change in the pattern of a psycho-neural arc resulting in a modified reaction, there would be a change in the apprehended quality. And by a progressive series of such changes a high degree of differentiation of consciousness could be produced. Our various visual sensory elements, with their motor responses, would remain more like one another, physiologically, and so psychologically, than they were like tactile events, for example, which early formed a diverging series. And of course we do find that visual experiences, though widely different from one another, are less different from one another than they are from tactile experiences. If brains had developed in a different way, who can say what sorts of conscious experiences not now imaginable by us might have been developed! Doubtless the experiences of many animals *are* so different from our own as to be quite unimaginable by us.

Our theory of qualities will be clearer when we discuss the nature of consciousness. It will then be evident that its explanation of the appearance to consciousness of qualities in a world of atoms and electrons solves this greatest of metaphysical puzzles. The idealist solves it by denying the existence of everything *but* qualitative existence. Realism,

however, is far too securely based to allow us to be content with such a solution. The pan-objectivists, who give all these superabundant sense-qualities (sensa) an existential status out there in the world, can not in the least explain how they are related to the atoms and electrons, or why they play no part in the executive order of nature. Which are real, atoms and electrons, or sensa? The temptation becomes great to treat the atoms and electrons as mere convenient fictions. But the actual experimenter in physics is convinced that these minute units are objectively real; and, moreover, that all the material world is composed of them and can be explained in terms of them. He has no use for sensa in his account of existence. So the conjectures fly back and forth, and will, until it is recognized that qualities are blurred impressions, imputations made by organisms in their dealings with masses of these atoms. They are labels that sum up for convenient handling complex events which cannot be attended to in detail.

I must admit, in conclusion, that the title of this chapter is misleading. Qualities are not really born, they never exist. They have their being in the realm of appearance, not in the realm of existence. If what I mean by this is not clear, I must ask a little further patience on the part of the reader. Chapter XV will discuss this "realm of appearance."

CHAPTER XI

PROJECTION IN SPACE

We have now considered two respects in which our data differ from the cerebral events that make their appearance possible, *viz.*, their relative simplicity and their qualitative heterogeneity—the latter being the result of the former. The data of consciousness are simplified summations of complexes of psycho-neural events; and even our "simple qualities" are really mass-effects.

But we do not usually react overtly to mere qualities. Most of the motor adjustments which enable us to discriminate details in our field of consciousness do not lead to visible motion of the organism; they remain merely incipient, a motor *set*. The overt reactions of our bodies are usually to objects of considerable size, in which many details are, or could be, noted. Thus the data of our consciousness are usually such as can easily be seen to be complex; we are aware of *objects* instead of such apparently simple qualities as appear when we attend to details.

And now we must note that our data are usually *objects in space*. Consciousness is, for the most part, perceptive. We are not aware of objects as mental complexes, we are aware of them as things in the outer world. And, indeed, to a considerable

extent the details which are noted in our field of consciousness—because of the separate incipient reactions provoked—are discriminated not as having a different qualitative nature, but as belonging to different positions in space. This localization of our perceptual objects in space is, in general, remarkably veridical. In so far, at least, as it *is* veridical, we have the actual spatial relations of outer objects present to consciousness. Science, building upon such data, consists largely of knowledge of the spatial relations of physical units.

We must consider, then, the process, developed in the evolution of organisms, by which an awareness of outer objects is produced. Let us take the commonest form of perception, visual perception. We have sensory events produced in the visual area of the cortex. Their bare existence, apart from their motor effects, would not be an awareness of anything. If they evoke a reaction, it is certain to be a reaction of a more or less projective sort (*i.e.*, an adjustment as to an object outside the body), whereas auditory sensations are often not projected, or only vaguely projected. If the reaction is simply to the color-quality, we may speak of ourselves as introspecting our visual sensations; we shall be aware merely of visual qualities, or of visual qualities as a phase of our experience, not of objects. But ordinarily we react to the whole group of supposed attributes of which the color is but a sign, so that what we see is not merely colors and forms, but colored objects.

It is important to note that we do not first see a color and then exteriorize it. We do not see the color at all, there is no awareness, except as there is motor response of some sort, a complicated neural arc. And if the response is not merely, as all responses are, a unitary response evoked by a complex of events, such as gives the object of our awareness its *qualities*, but is, at the same time, an adjustment of the organism to an outer object, the qualities are seen in the first instance as *qualities belonging to an outer object*. The sort of reactions that produce what we call esthetic contemplation (the mere enjoyment of the color) or introspection (awareness of the events that make up our own mental life), play commonly a minor rôle in our lives. We are essentially outward-looking. What we may call "qualitification" and "perception" result from a sensori-motor process that functions as a unit.

The definition of perception is more or less an arbitrary matter. But perhaps we may most conveniently say that all that is necessary for a perception, of a rudimentary sort, is a sensory event caused by an outer object, however meager and faint or intense and detailed that event may be, and a reaction evoked by it to that outer object. We should say, then, that any animal that reacted to an outer object which was stimulating one of its sense-organs, *perceived* the object. But of course we do not forget that there would be no perceiving, in the sense of a form of conscious experience, if the cere-

bral processes that intervene between the events in the sense-organs and the reaction were not psychic in nature. And some of our perceptual acts are so rapid, so "automatic," or so divorced from the main stream of our reactive life, so unrememberable, that it is a question whether we ought to speak of the experiences as "conscious" experiences; and, if not, whether we ought to call them "perceptions." This is a matter, however, which we may leave for the present.

In any case, in a developed perception there is much more to the story. As soon as we react to an outer object, kinesthetic return-waves from the muscles adjusted pour in. The sensations of the accommodation of the lenses of the eyes, and of the convergence or separation of the axes of the two eyes, as we focus nearer or more remote objects; the sensations resulting from the turning of the head and the eyes to focalize an object, together with the multitudinous incipient adjustments evoked by every detail in the scene that in any degree attracts our attention, the sensations of the tenseness of the muscles in the neck, forehead, and elsewhere, which are a part of the attention-reaction; and the sensations coming from the tentative movements of the muscles that we should use in grasping and feeling of the object, or in walking to it—all these kinesthetic sensory elements add themselves to our cerebral complex. Although they are not separately attended to, they help to make our adjustments to the object more definite and appropriate,

and hence to make our perception of its spatial size, distance, and location more accurate.

In the perception of familiar objects, the sensori-motor complex usually calls up by association image-elements, which give additional meaning to the object reacted to, as the bodily adjustment correspondingly develops. Indeed, the primary sensory elements may be very faint, or minute, and the adjustment (and consequently the datum of consciousness) mainly determined by the associated elements. A large part of the material for our developed perceptive experiences is supplied by the mind from its own inner stores—the particular ingredients associated depending, in neural terms, upon the relative permeability of the various adjacent brain-paths, and the prior sub-excitement of neighboring paths or areas. So we eke out our fragmentary sensations and perceive far more than (as well as far less than) what is actually before our eyes. We may have incipient images of the other sides of an object, or of the object as seen under other circumstances, or of its characteristic behavior or past history. We may see a coin as round, no matter from what angle we view it; we may see the corners of our room as square. The data of consciousness are not merely the perspectives of outer objects that a camera-film, properly placed behind a lens, would see; they are shot through with meanings derived from the peculiar nature of the perceiving organism. The result is that while sensation usually distorts the nature of

outer objects, perception often corrects that distortion and presents to consciousness objects as (in some respects) they really are.

Thus a lion glimpsed by a man in the jungle is not seen merely as a form and color-pattern. It is seen as of such and such a stature, at such and such a distance. It is seen as a three-dimensioned animal shaped like other lions that he has seen, or seen pictures of, or imagined. Moreover, it is seen as a living creature, of tense muscles, breathing, fearing him, or meditating attack. Much of what he has heard about lions may add itself vaguely to the sensory factors. The result is that his body becomes tense, preparing for flight, or preparing to raise a rifle, or perhaps paralyzed with fear. Reports of this bodily condition quickly join the total of his psychic elements; they are the numerous systemic and kinesthetic sensory elements, which, when noted *en masse,* he would call excitement, fear, exultation, or what not, as the case may be. If they *are* noted *en masse, i.e.,* if the man's attention is to any degree attracted to his "state of mind," he is aware of himself as excited or afraid. But if his attention is wholly concentrated on the lion, the emotional states color his perception, and contribute an exciting or fearsome character to the *lion.* Thus we project our "states of mind" in varying degree under different circumstances. And it is very difficult to know exactly what we do project at any moment—in other words, to know exactly what our perceptual datum was. For we are very apt to read

back into the moment of perception upon which we are reflecting, characteristics that were not actually yet present to awareness.

In any case, however, we have in any developed perception an extremely complex constellation of cerebral elements, provoking multitudinous tentative movements, as the body adjusts itself accurately to the specific thing before it. Cues were received from some sense-organ, but they were only the starting point for the development of an intricate perceptual complex. It is the addition of these further elements that constitutes, for most realists, the difference between sensation and perception. Mr. Bertrand Russell, for example, makes the difference consist in the addition of "mnemic phenomena" (*The Analysis of Mind,* p. 132), and Mr. Whitehead in "the concurrence of subconscious sense-objects along with one or more dominating sense-objects" (*The Concept of Nature,* p. 155). I submit, however, that a mere complication of sensory elements would not constitute a perception; and, on the other hand, perception of a rudimentary sort does not involve any such complication. The essence of perception consists in the fact that the organism, having received a stimulus from the outer world, is adjusting itself to an outer object. What complication by additional elements does is merely to make perception fuller and more accurate.

Perception commonly has a certain unity. Although there is usually a setting of vaguely noted objects about the central object of perception, that

central object stands out from its less clearly apprehended context by its greater clearness and detail. This unity that our datum has for us, in spite of the great complexity of the cerebral complex and muscular set involved in its appearance, is clearly due to the fact that the movement-system produced is a unitary response, adapted to adjust the body to the particular existent upon which the eyes are focused. By coördinated muscular contractions we do one sort of thing; and in the degree that we do one thing, we are conscious of one object. Either this movement-system or that is set off; and so we see either this or that determinate object. Only if various movement-systems so inhibit one another that nothing definite is done, is our perception confused, so that we do not know exactly what we see.

The fact that this determinateness of perception is based upon the tendency of the organism to do some definite thing is illustrated by the case of "ambiguous figures." In one such figure, one motor set makes us see a staircase. Fatigue ensues presently, and an untired motor adjustment replaces the tired one. Immediately we see an overhanging broken wall instead of a staircase. The visual sensory elements are unchanged, but a new motor adjustment has replaced the former one (we can feel the muscles of the eyeballs moving), and a new sort of awareness is thereby produced.

A number of recent writers on philosophy have accepted the fact of projection as accounting for our perceptual experiences; but very few seem to

have any idea of how projection is possible.[1] Others have rejected the notion of projection because of their inability to see how it is possible. M. Bergson, for example, asserts that we could never "get the notion of exteriority" at all, if our sensations are *in us;* we could never "explain the preference of a given one of these sensations for a given point of space," or explain how visual extension unites with tactile extension (*Matter and Memory,* pp. 43, 47, 65).

But the answer is easy. A given sensation is referred to a given point of space because it evokes a bodily adjustment to an object at that point of space. Visual extension unites with tactile extension because the two sets of sensations join in evoking a single motor set. The sense of exteriority is the result of the fact that our eyes are focused upon a given portion of space, and our bodily reactions are adjusted to what exists there. That is the dominating fact in perception. It makes what would otherwise be a mere "subjective" experience an experience-of-something-out-there. During perception our cerebral events are unimportant in themselves, they are signs of something else outside the body; hence we are not attending to them as states of our being, we are looking *from* them, so to speak, at the outer object. The purely visual elements may fade into a memory-image, as when light grows too

[1] It is clearly explained in the opening paragraphs of Mr. Strong's *Theory of Knowledge.* Also in Chapter XIV of his *Origin of Consciousness,* and in his *Mind* articles on "The Genesis of Appearances."

dim for seeing. Auditory sensations, similarly, may fade into images, when the sounds grow too faint for hearing. But if the body is still adjusted to the thing as at a certain position in space and of a certain nature, the fading of the primary sensory elements is of no importance. It is what we are prepared to *do* that determines whether our perception is accurate or not. Thus we may perceive the same object at different times by means of very different sensory material; so long as the cerebral complex calls up the same system of bodily adjustments, the object is for us the same.

We doubtless inherit our projective tendencies, but it is only by long experience in childhood that we make precisely appropriate connections between sensory complexes and motor adjustments. By walking up to objects, feeling of them, seeing what parts of our body are moving when we have certain kinesthetic sensations, and in various other indirect ways, we learn to connect suitable motor reactions with our visual sensations, and thus apprehend correctly the size, shape, and position of outer objects. It is a process of learning by trial and error. And it is only as we have developed this ability of accurate localization that sensa come to seem to us to be where the pan-objectivists so roundly assert them to exist. The baby who grasps for the moon does not see it away off there in space where the sophisticated adult sees it. *His* datum is "something bright and shining close by." And of course we have all had experience of spatial illusions, when we were

deceived as to the distance and size of objects. Surely it is quite clear that the distance from us at which we see our sensa, and therefore the size which we see objects to have, depends upon the working of our machinery of projection. But projection is merely the *referring* of character-complexes to a certain position in space; it is a process of imputation, based upon motor tendencies. How naïve, then, seems the sensum theory, which insists that sensa—our projected sensations—actually exist out there, wherever our projective machinery may localize them!

The fact that we project a sensory complex into a certain position in space does not prove that anything of the sort exists there. But, on the other hand, in so far as our adjustments *are* appropriate, our mechanism of perception is working successfully, and we are divining accurately the nature and position of an outer existent.

There is nothing very difficult to understand, then, about the transcendence of cognition. There is no actual, existential presence-in-absence—that would be nonsense. An object is not present, spatially, anywhere except in its own place, any more than the past is present now, temporally. Existentially speaking, everything keeps to its own place and time. But the absent and the past object may be *present to consciousness,* as the phrase is; this is a totally different use of the term "present." It means simply that the object is "given," a datum for a certain organism. And this means

that a complex of psycho-neural elements within the organism prompts a complex muscular adjustment of a definite sort, appropriate to a definite sort of object. If the object is localized, it is because the adjustments are to a thing existing in that particular place. The cerebral complex, reinforced as it is by the mass of kinesthetic elements produced by the motor set, is capable of evoking, among the appropriate reactions, a description of the object as being at such and such a place and having such and such qualities. What we should then be describing would be our "perceptual datum."

The transcendence of consciousness is thus primarily a fact of the behavior of the organism—the fact that the organism adjusts itself to outer objects. Visual, auditory, and tactile sensory impressions alone would never have given us consciousness of an outer world; they would have formed a complex private dream without spatial reference. But the brain gets reports of all the body's behavior. And so, almost as soon as the *body* takes outer objects into account, the *mind* takes them into account. From the very beginning of animal evolution sensory impressions must have been referred to the outer object, danger or food as the case might be. Indeed, up to the development of reflective man, animal consciousness must have been almost wholly perceptive, *i.e.,* projective.

The discussion in this chapter has confined itself, for the sake of clearness, to visual perception. But

there should be no difficulty in applying the principles to other forms of perception. Auditory sensations are much less clearly localized, and may even be not projected at all, as in the enjoyment of music, where the melodies and harmonies may be simply felt as floating, without being referred to the instruments from which the sound-waves proceed. When we do sharply locate sounds, as when we hear a disturbing noise, it is clearly the reaction of the organism that causes the local reference.

The data of consciousness are thus far from being the indisputable elements of existence that many philosophers have taken them to be. On the contrary, their appearance is the result of a complicated organic process, and their veridicity a matter of varying degree. Far the greater number of our data are perceptual data. These are, qualitatively, simplified summations of multitudinous cerebral elements, and in their spatial aspect projections of these quality-complexes into the positions with reference to which the body is adjusting itself. The "feel" of the perceptual experience is just the "feel" of the cerebral elements, their own private life at each continuing moment. But the *description of what is experienced* is not the description of these cerebral elements, for our descriptive processes are part and parcel of our reaction-mechanism, and in the service of our adjustment to the world in which we live. The description is, or at least may be, a correct description of the *datum;* for by that term

we mean what we *seem* to have before us. But it is only because of the ingenious adaptation of our receptive and reactive processes that the datum turns out to be also, at times, the very thing, or some actual feature of the very thing of which the organism is taking account. That physical thing exists, as physics reports it. The cerebral complex exists, perpetually growing and changing. The organism exists, with its continually shifting motor sets and overt reactions, among which may be the description of an object seen. But the "object seen," the perceptual datum, is probably not in all respects, if it is at all, identical with the physical thing looked at; and it is certainly not identical with the cerebral complex, or the reacting organism. In its non-veridical aspects it is merely an item in our universe of discourse.

CHAPTER XII

PROJECTION IN TIME

Since we live in the midst of an Order that is temporal as well as spatial, we have to adjust ourselves to objects that are not merely about us in space but are also enduring and changing in time. By a process analogous to that which we have called spatial projection, we become aware of this duration and change, aware of the past and the future. We may call this *projection in time.*

There is a good deal of nonsense talked about this awareness of past and future, just as there is about the awareness of the outer world. Bergson, for example, speaks of our past mental life as if it were all somehow still existing; and many writers who agree that the remote past has vanished for good seem to think that the immediate past is coexistent with the present in what is called the "specious present." Just so these writers speak of spatial "interpenetration," of things as being simultaneously wherever different perceivers take them to be, or as being wherever they exert an influence.

Such loose talk is needlessly confusing. There can be no present existence of past events, if realism is true, and no anticipatory existence of a future event before its time. The events of even a minute fraction of a second ago are dead and gone at the

present moment, and events of the coming second are not yet born.[1] The revolution of an electron, for example, may occupy less than a billionth of a second; after that event is over, it is over, and can never exist again. An event at a later moment would be another event, possibly just like the first event, but existentially different because having a different temporal locus. Just so no event can be in two places; the event at the second place would be a second event. It is indeed true that events remote in time and events remote in space can be "present to consciousness" now, *i.e.,* be data of our present awareness. But the only existents here and now, in such a case, are the organic events. Consciousness can not alter the time or place of the events it knows. Consciousness is a fact concerning the organism; remembering, like perceiving, is thinking *of* something, imagining it. That cognitive activity of the organism does not affect the character or locus of the existent thing or event thought of, imagined, remembered.

The prevalence of the current inaccurate and confusing expressions about the spatial and temporal locus of existents is clearly due to the failure to realize the actual nature of perception and memory. If the account given of them in this volume is correct, there is no need to juggle with the spatial or temporal locus of anything.

[1] Even if we adopt Mr. Broad's language, and say that whatever has ever existed exists eternally, we must admit that past events have not *present* existence, existence at this present moment. And certainly *future* events haven't.

Let us apply this to *time*. The "specious present" is the span of events that we can take in at one glance, so to speak, because, through their lingering after-effects in the cerebrum, they are simultaneously affecting our motor adjustments. Just so, what we might call the "specious present of space" is that spatial group of objects to which we are reacting at any one time. In both cases it is the simultaneously existing sensory impressions in the cerebrum that incite a particular complex motor set, and it is that adjustment of the organism that carves the particular temporal and spatial span out of a world that stretches out far beyond in space and time. Our cerebral life, excited by a number of sensory nerves simultaneously, varies concomitantly with their outer stimuli, and is therefore able to incite a motor set successfully adjusted to that group of events. Thus arises perception of the group of events from which the sensory messages simultaneously arrived. But further, our sensory events have echoes, fading counterparts, for a brief span of time, before excitement in those spots ceases. The group of sensory events whose after-effects are still affecting the motor set of the organism are thereby factors affecting the awareness of the moment. The "specious present" includes all of these events, from those whose after-effects are about to disappear to those which have but just come into being.

This is the phenomenon of "primary memory." Sensory effects in the cerebrum linger on for a brief

but varying interval after the cessation of the stimulus that excited them. During this interval they fade out, until they have entirely disappeared. Meanwhile new sensory elements are coming sharply into existence through the impinging of new currents from the sense-organs. We have thus in simultaneous existence sensory elements brought into being at succeeding moments, and therefore, at any one moment, in various stages of fading. And we have at any one moment a set of motor adjustments produced by this constellation of elements fresh and fading. These adjustments will change with the fading of the sensory elements, so that the nearly-faded sensory elements will be producing adjustments as to earlier events, while the fresh elements will be inciting adjustments as to later events. For the fresh sensory elements are signs to the organism of temporally present outer events, while the fading elements are signs of the outer events of a moment or so ago. Thus, whenever we are confronted with objects whose changes are on the scale to produce in us a succession of simultaneous patterns of fresh and fading elements, our changing bodily adjustments will be adjustments to a changing world. Meanwhile our changing adjustments will be sending a flood of currents to the brain, and the kinesthetic sensations thereby produced will make more accurate our awareness of the changes we are perceiving.

For the perception of a change, there must be, then, at each successive moment a pattern of co-

existent psychic states corresponding (in terms of the factor of relative fadedness) to the temporal pattern of events-that-have-just-elapsed. Just so in spatial perception there must be a cerebral pattern corresponding to the spatial pattern of the portion of outer existence perceived. Only this changing cerebral pattern, and its motor consequences, are a part of *my* life; and only a simultaneous cross-section of it exists at any one moment. The spatial pattern of the outer world is hopelessly outside me, and the past moments of even my cerebral pattern are hopelessly past and gone. But the pattern in my brain enables me to adjust myself to the outer spatial pattern, and thus to be conscious of an outer world. Similarly, the temporally present pattern of any moment enables me to adjust myself to, and so to be conscious of, the events occurring in the brief span between the time when not-yet-quite-faded-out impressions were first produced and the present moment.

There may even be some adjustment to, and so anticipatory awareness of, imminently expected events. In this case the "specious present" may be said to include a tiny bit of the future as well as a tiny bit of the past. Certain sensory elements have been brought into being by association, images of sensations which would commonly follow on the heels of sensations already experienced; and the adjustments which *they* produce are adjustments to events-about-to-happen.

The foregoing analysis of the existential ground

of our awareness of a changing world applies, *mutatis mutandis,* to the case of awareness of changes in our mental life. In this case our motor adjustments are not to an outer world, but to a changing series of mental states. Our partially faded sensory states are used as signs of the fresh sensory states of which they are the fading successors; but neither these nor the simultaneously present fresh sensory states are used as signs of outer events. Thus no kinesthetic sensations of adjustment to an outer world are added to the psychic total; or if such adjustments are to some extent instinctively made, they are discounted or ignored in our descriptive reports. But kinesthetic sensations of adjustment to a changing mental history are being added to the cerebral life of each moment. Thus our descriptive reports, in such cases, tell of a changing mental life instead of a series of outer events.

So far we have spoken of our mental life as constantly changing in character. But steady sensation-processes, produced by outer events that are, in their mass-aspects, unchanging, produce steady, relatively unchanging mental states. (These mental states are, indeed, composed of innumerable minute events, just as the outer objects are; but the minute cyclic changes are irrelevant, in detail, and play their part in both cases, so far as bodily reaction and consciousness go, only *en masse.*) If the total cerebral life of any given moment were entirely

composed of such steady mental states, we should cease to adjust ourselves to a changing order, and cease to have a consciousness of change, or even of duration. And in so far as we concentrate our attention upon the unchanging characters of our experience, that is exactly what happens; we contemplate a still landscape, a picture or building, some static concept, some eternal truth, and cease, for the moment, to be aware of the passing of time.

But always in the background of our mental life there are changing elements, due to fatigue, to shifts in attention, and to the rhythm of bodily processes —the beating of the heart, the coming and going of the breath, the movements of the eyeballs, etc. In so far as these changing elements (or the bodily events which they bring before us) attract some slight attention, not enough to make us clearly notice them, but enough to serve as a changing background for the steady appearances in the foreground of attention, we have what we may call the sense of duration without change. That is, the objects in the focus of attention are discovered to be steady, while the changing background furnishes a dim sense of change. Something central, unchanging, against a background of something changing—that is the source of our consciousness of duration.

The case of reproductive memory can be readily understood on the basis of the above analysis. When we receive the impact of currents from the periphery, we have the vividness of sensation, and motor

adjustment is to present outer objects. When sensori-motor processes are set off by association, we have bodily reactions of a merely incipient sort. The cerebral complex is different from that which would be the basis of perception in two ways: it has, instead of the tang of sensation, the feel of an "image" (we noted some of the differences in Chapter III); and the kinesthetic ingredients are different, since they come from a different type of motor set. The associations of the two sorts of sensori-motor complexes are different, the one sort leading to thoughts and acts appropriate to an object now confronting the body, the other to thoughts and acts appropriate to an object taken as absent. In this latter case, where we have a revival of the group of sensory elements that once constituted the basis of a perception, we think of, *i.e.*, in a sense we remember, the same object or event that we perceived on the earlier occasion. Our motor set is now of the contemplative sort; it involves no gross movements of the organism, probably, but prompts to the activity of thinking, and very likely causes more or less emotional reverberation.

In so far, however, we are not yet *aware* of remembering. We are recalling a former experience, but not thinking of it *as* a former experience. Memory that is aware of itself as memory is, as M. Bergson correctly sees, more than recall. It involves a special sort of motor set, *viz.*, an adjustment to an event taken as having happened in the past to the individual remembering. This involves

a partial recall of events that were the setting of the past experience, a dimly revived context of personal history. Recalled complexes thus fringed with personal associations provoke the special adjustment as to an event in the personal past. In other words, what we usually call memory is the use of revived mental states as signs of past experiences, or of events perceived in the past.

The discovery and exposition in detail of the various types of motor sets which are responsible in such high degree for the different types of conscious experience is the task of the psychologists. Enough work has already been done to reveal the enormous complexity and the decisive importance of our motor adjustments. The details can not be gone into in a volume of this nature. But I wish to submit at this point that Bergson's argument concerning memory falls completely to pieces as soon as one fully grasps the revolutionary bearings of the new motor psychology.

Memory normally reproduces the order of events as formerly experienced; this is, of course, because it reproduces the adjustments upon which primary memory depends. The type of adjustment that makes primary memory possible is the adjustment as to A-passing-into-B. Reproductive memory, then, will give us again this same datum A-passing-into-B. The recall of the sensory elements may be quite fragmentary or imperfect. But if the earlier reaction is repeated, the reaction as to that particular object or event, we recall that object or event,

however inadequately. We may merely revive, mentally, the event, by repeating this reaction. But if we remember it as having a certain locus among other events, or in our personal history, it is because we are remembering not merely the event itself, but, however dimly, a fringe of surrounding events in the outer world or in our past experience. And it is this that we commonly call memory.

The anticipation of events in the more or less remote future is to be distinguished from the sense of an event about to happen, just as the memory of events in the more or less remote past is to be distinguished from the primary memory of what has just happened. In fact, anticipation is closely analogous to memory. The future event is "given," as the past event is given, by means of image-elements and a particular sort of organic adjustment. It is instructive to ponder upon this analogy, because nearly everyone will agree that the future event is not yet existent, even though it is a datum of consciousness, whereas many fail to realize clearly that a past event, even an event of a moment ago, is just as truly non-existent now. We are naturally more aware of the supposititious nature of the future event present to our consciousness; but the past events which are present to our consciousness are just as truly supposititious, though the chances are doubtless greater that what is present to our minds is what actually existed in the past than that the future events we are think-

ing of will turn out to be exactly the events that actually take place.

This supposititious nature of all our data applies even to primary memory, though the opportunities for error are far fewer in this case than in the case of reproductive memory, anticipation, or perception. Primary memory may be deceptive owing to the uneven duration of mental states under varying circumstances and the imperfectly co-ordinated nature of our motor adjustments. Thus we foreshorten or extend our mental life, in looking back at the immediate past, and have a very uneven awareness of the actual temporal relations of our own mental events or of the outer events that we cognize by projecting them. We have developed a very acute ability to catch and recall the relations of before and after, since those are often of great importance to us, as in the case of speech. But we have a far less developed ability to catch or recall the exact duration of these events, since this is usually of little if any significance.

We have no way, then, of knowing *any* reality accurately and completely in immediate experience of any sort. Accurate and complete knowledge, to the extent that we can get it, is the result of testing and sifting and checking one experience by another, and thus forming eventually a concept of the reality as it was, or is. In important respects our immediate impressions may turn out to be correct. But even introspection, even primary memory, are to be taken warily. The data of our ex-

perience are, as we said in our opening chapters, only presumptively existent; in any given case we may be subject to illusion. Both in perception and in introspection we are subject to the illusion which I have called "qualitification;" and in introspection it is very difficult to get away from our instinctive habit of spatial projection. Our temporal projection is, on the whole, quite reasonably veridical. But of course it is conceivable, theoretically, that the data now present to my consciousness might be hallucinatory in both their spatial and temporal aspects. To be accurate, we must say that belief in the past and future is a faith, just as is belief in an outer world. Still, realism in both respects is what our bodies have learned; and if we are to live at all, we must, in practice, adopt that view, and let our bodies continue their deeply ingrained habits. Such a faith Mr. Santayana properly calls animal faith. Perhaps, to set it farther apart from more dubious faiths, we had better call it by its other name, common-sense.

CHAPTER XIII

"SUBJECTIVE" EXPERIENCE

We have seen that our awareness of things in space takes place through a process of "projection," or "exteriorization." Our efferent nerves, prompted by a complex of cerebral elements, cause the body to adjust itself to these outer things, to take cognizance of them. Similarly our awareness of the passage of time, and of change, takes place through an analogous process of temporal projection. The ever-changing cerebral pattern of fresh and fading sensory elements incites a continually changing set of organic adjustments; the factor of relative freshness and fadedness causes them to be adjustments to the temporal aspects of events.

Our conscious life is for the most part spatially projective; it includes perhaps even more pervasively a sense of change or duration—so much so that M. Bergson and others make duration the essence of mind. But this double process of reference to place and time does not always occur; and when it occurs it may be with any degree of definiteness. Some of our data are not "objects in space," some are not "events in time." Others are only vaguely projected, without being definitely localized. It is these detached objects, not apparently belonging to the one spatio-temporal Order, that give rise

to the conception of a subjective, or mental, realm, outside of space, and perhaps even outside of time, in which they have their ghostly existence.

Our theory utterly rejects the notion that there is any such ghostly sort of existence. Nothing exists, except as it has a definite locus in space and time; indeed, the spatio-temporal Order is nothing but a set of relations between existents; and it includes them all. Everything that exists is, therefore, discoverable, theoretically, by physical science, and has its part in the causal nexus of nature. But our theory recognizes clearly, and can explain, the facts which give rise to the notion of a subjective realm; it can do justice to the insight underlying ontological dualism, as the current pan-objectivist realisms can not.

Pan-objectivism was plausible, up to a point, when only perception was considered. Sense-data have a *prima facie* appearance of being simply the things that exist about us. Even when we are contemplating a patch of color, without explicitly thinking of it as the color of an outer object, we are dimly aware of the focusing of our eyes upon something outside the body, and of surrounding objects in space; we can not escape consciousness of the fact that we are looking out. Hence we do not naturally think of any sense-data as "subjective," or as objectively existent in our heads. And it is only by reflection upon the hard facts of the case that we come to believe that the sensuous qualities of sense-data do not exist in the physical things

about us. Even when reflection suggests that these "secondary" and "tertiary" qualities are somehow due to the perceiving organism, it is possible to insist, as the pan-objectivists do, that they exist out there in space nevertheless. The mysteries of the sensum theory are perhaps no greater than the mysteries of ontological dualism. Only our theory, sailing between Scylla and Charybdis, can bring peace to the bewildered student of perception.

But when we turn to consider images, thoughts, desires, emotions, and the like, the pan-objectivists are forced either to merely verbal solutions of the difficulties, or to views so grotesque as to be incredible. Here the advantage of relative plausibility is with the dualists. For not only is there no place in the physical world in which to put these data of our experience, they do not even *seem* to belong anywhere in the physical world, as all sense-data do. These "subjective" data are but vaguely, if at all, projected; they "float," with no local habitation. And it was for these homeless appearances that the conception of a non-spatial, but still existential, realm was developed. Once the notion of it is accepted, this realm that is nowhere has many uses. Into it can be put everything for which no locus can readily be found in the objective spatio-temporal Order, all secondary and tertiary qualities, all sense-data produced through distortions of the objective spatial order created by perspective, by mirrors, by refraction, etc., and all other data that are *de trop,* such as the fanciful objects of

dreams and irresponsible imagination. This has the great advantage of leaving unencumbered the simple, straightforward physical Order in which common-sense and science believe.

It is a tempting solution for our epistemological difficulties, this imaginary limbo into which all the incongruous elements of experience can be cast. But nothing, alas! is explained in this way. What sort of existence anything could have in this non-spatial realm, and how it could interact with the things in the spatial realm, remain insoluble mysteries. Like so many other epistemological ventures, it is a merely verbal solution for a complex situation which needs to be unravelled and understood.

The truth is, as we saw in our opening chapter, that these homeless data do not exist at all, as we describe them, either in space or anywhere else. There is, of course, an existential basis for their appearance (*i.e.,* for the fact that we imagine them); that basis consists, as in all experience, of the multitudinous elements of the psycho-neural processes in our heads, and our muscular adjustments. It is to this psycho-neural mechanism that we have given the name "mind;" and the complex events that make up its life are our "mental states." Without them we should have neither "subjective" nor "objective" data. But the data that appear to us, the objects which furnish the material for our discourse, are, except in introspection, quite different. They are just imputations. They are what the

body is taking into account, when such and such mental states exist.

The fact that we live as in the presence of these data is, therefore, intelligible, in spite of the fact that such objects may be found, actually, nowhere in any realm of existence. Whether or not they do exist somewhere in nature is not determinable from the fact that an organism is adjusting itself as to that sort of object. In so far as perception, or introspection, or conception, or memory, is veridical, just these entities do or did exist. Otherwise we have no reason to suppose that they exist in *any* sort of realm.

With this principle in mind, we may speak briefly in turn of the various data of our experience that are commonly called "subjective:"

1. In the case of imagination, the cerebral complex differs in various ways from the complex underlying perception. The afferent sensory nerves (except the kinesthetic nerves) are not functioning, or the sensory events they are producing are not attended to, perhaps are wholly dissociated. Instead, there are many "image" events, excited by association, usually far less vivid and detailed than the similar sensory events excited by currents from the sense-organs. The motor responses are correspondingly slighter. But there must be such responses if we are consciously to imagine anything. In visualizing an object, for example, there are always motions of the eyeball-muscles; indeed, it is

difficult or impossible clearly to visualize a distant object if the eyes are fixed upon a near-by object or are paralyzed by atropine. Through these slight movements of the eyes some sort of outer reference is inevitably made, as to an object near or far, up or down, etc., as the case may be. Thus in visual imagination we do project, to some extent; but vaguely and floatingly, except as a context of topographical ideas fixes the place of reference—which may in that way be very precise, however remote: as, for example, if I think of the details of a certain spot that I know in Spain.

Similarly, in imagining sounds we take the attitude of listening, and make movements of throat, lip-muscles, or body. In imagining odors we sniff; it is impossible to imagine them clearly when exhaling. Through these bodily movements we make some objective reference; but the reference remains vague, except as the image is associated with other images which give it a definite locus.

On our view this is as intelligible as perception—and not so very different. But for those who have not understood the existential situation in all these acts of awareness, imagining is apt to seem more mysterious than perceiving. In perception it may be superficially supposed that when we have described the physical thing in front of the organism and the sensori-motor reactions of the organism in physical terms, we have completely described the situation. But in the case of imagining a non-existing object, can we say that we have in the series

of cerebro-muscular events all the existents concerned? The behaviorists would say, Yes, the dualists, No. Our answer is: The behaviorists are right, if they will acknowledge the psychic character of the cerebral events; otherwise they can not account for the appearance of the non-existing object as an item in conscious experience. The dualists are right in insisting that there is a psychic existent concerned; but they must acknowledge that it is not the objects imagined that have psychic existence (for they are the product of "fusion" and "projection"), but the cerebral events themselves, which incite the fusing and projecting processes.

Now when this is understood, it will be seen that the case of perception is essentially the same; only in that case there is a physical thing stimulating the sense-organs, and so determining the cerebral events; and, because of this, the objects imagined, though still different from the cerebral events, may coincide, in significant respects, with the physical stimuli. In the case of imagining a non-existent object, the datum of consciousness (the object imagined, what we are thinking of) is, by hypothesis, non-existent. But then we may ask the pan-objectivists, if the organism *can* contemplate essences which have no sort of existence, why may it not be true that when it is confronted by existing things it is still contemplating essences, imagining objects, which are only in certain respects identical with the objects existing in front of it, and in other respects non-existent? But to acknowledge this pos-

sibility knocks the bottom out of the sensum theory and the "new realism."

2. Abstract *conception* has been still more of a stumbling-block for the pan-objectivists, and a source of comfort to the subjectivists and dualists. "Concepts" are usually still less detailed than "images;" if superfluous details are imagined, they are treated as irrelevant, only the generic features controlling the motor responses. Many concepts—especially those of good vizualizers—are vaguely projected. But in the case of such an abstract concept as "perfection" there is no outer reference. The object of consciousness is now something illustrated, if at all, in various particular cases, no one of which is specifically referred to; it does not exist, itself, either in an objective or in a "subjective" realm. What does exist concretely is, as always, the psycho-neural complex, which tends to arouse such and such associations, to evoke such and such motor responses, and such and such a description of what is meant.

To speak, as behaviorists do, of such a situation as describable in terms of an organism reacting to a logical entity, or subsistent, is right, if the organism is understood to have a psychic nature. The logical entity, not existent but subsistent, referred to in such realistic formulas is, indeed, the datum of consciousness in the types of experience we are discussing; and these writers in so far support our contention that the datum of consciousness need not be an existent. But if so, neither need a sensum

be an existent. It, too, may be a mere subsistent; the fact that it is, perhaps, more vivid, or that our eyes are open, does not affect that possibility. In fact, epistemology has concerned itself too much with perception; for perception has become so definite and instinctive that it is difficult to distrust it. The cases we are now considering are more illuminating; and it is safe to say that they would never have led to pan-objectivism.

3. *Dreaming* is simply a case of imagining when asleep. Because of the bodily condition during sleep, dreams are usually very fragmentary and confused, quickly forgotten, and practically unimportant. Our dream-objects, like our waking images, may be existent things, or absolutely non-existent objects, or something between the two, distorted objects of every day life. What to do with dreaming has always been a puzzle to a realism that wishes to dispense with psychic states. When I dream of a dragon chasing me, it is not enough to say that there is awareness of a non-existent entity. That states the case but does not make it intelligible. The dragon, which is my datum at the moment (and it may be as vividly present to me as many a perceptual datum), does not exist. But *something* exists, in addition to what physical science could discover (even theoretically), in the way of neural currents and organic movements. Dreaming is, of course, vivid mental life (whose psychic character no outside observer could discover), accompanied by continual incipient move-

ments of the organism, which perform the operations of fusion, projection in space, and projection in time, and thus define for us the meanings which our mental life has for us as it passes, define the objects which we call the data of our dream-consciousness. Whether these objects exist or not is quite irrelevant to the psychology of dreaming.

Dream-objects are usually projected. But the trouble they cause the pan-objectivists comes from the fact that there seems to be no room for these quality-complexes in the outer world, and that they seem to play no part in the causal order of outer events. No one but the dreamer can really believe that they are there. They are of the type of sensa, and, following the line of the sensum theory, should exist out there where they seem to be. But just where *do* they seem to be? And can we believe, anyway, that these dragons and fanciful landscapes and people, or even just the colors and shapes and sounds, really exist where we dream them to be? or anywhere? But if dream-sensa are non-existent, why may not waking-sensa be non-existent?

4. Another sort of experience which we may be tempted to put into a subjective realm is *emotions*. Here we have to do with very complex cerebral processes and movement-systems. Predominant among the cerebral elements are kinesthetic and visual sensations, in masses, varying with the different emotions. If we pay attention to these bodily sensations separately, we are in the perceptive attitude, *i.e.*, we are projecting our sensations into

the various parts of our bodies from which the nerve-currents have come, and thereby becoming aware of various bodily movements and tensions. But when we do this, the peculiar quality of the emotion evaporates. For that specific quality is the result of the fusion of all the elements, a simplified summation of bodily sensations so widespread and multitudinous that we fail to attend to the components separately, and are only aware of them *en masse*. An exciting sensation aroused by a message from without the body, or an image aroused from within the brain by association, initiates the emotion. But the emotion itself consists in the sensations produced by return-waves from the bodily reverberation instinctively generated by the exciting sensation or idea. A mass of obscure bodily sensations besiege us, clamoring simultaneously for our attention; it is a case, as we have said, of not being able to see the trees because of the forest. We label our seething mass of psychic life "anger" or "fear," etc., according to the sort of total it is, and the tendencies to action associated with it. And this is far more practically useful than a detailed description of our bodily perturbations. For these bodily movements constitute a system, developed by the process of evolution, useful to the organism in some type of emergency; and to know which system is evoked is the important thing, rather than to know of what factors the system is composed.

5. *Pleasure* and *unpleasure* are also probably

fusions of a great number of organic sensations, differing from the various emotions in their relative poverty of kinesthetic sensations, and passing into them as the number or intensity of these kinesthetic sensations is increased. When the organic sensations come conspicuously from one part of the body, the pleasure or unpleasure may be referred to that locality; or it may be referred to some part of the body where the exciting stimulus is being applied, as in tickling, or tasting, or in any form of local pain. In esthetic experience it is localized in the physical thing that is stimulating the sense-organs; the projected pleasure blends with the projected color-sensations or tone-sensations, and is thought of as the "beauty" of the object looked at or the music listened to, just as the color-sensations are thought of as qualities of the object, and the auditory sensations are vaguely referred to the musical instrument or to the surrounding space. But in the greater part of our experience the stream of organic sensations continually pouring in contributes simply what is called by psychologists "feeling-tone" to our experience, and is not projected at all. It is in any case impossible to analyse pleasure and its opposite into their multitudinous components, and so it is impossible to analyse them out of existence, as we can sometimes do with the more violent complexes that constitute emotions. But nothing shows more clearly the part played by projection in our conscious experience than the three possible ways of taking our pleasure-experiences—

as the "feeling-tone" of our mental life, unprojected and left floating, as a local happening in some part of our body, or as the beauty of external things. In all these cases the organic sensations and the cerebral states produced by them are much the same; the difference is made by the motor responses which variously locate them, and the kinesthetic sensations which report those motor adjustments.

6. *Conative experiences* may be defined, in a phrase, as experiences in which there is a predominance of sensations coming from actual or blocked bodily action. Emotion was the result of widespread bodily reverberation, movements of a secondary nature, not the result of intent, but instinctively generated, and at most a stimulus to action in the world. Conation implies action in the world, or the effort toward it. The sense of effort is due to tensions (static movement-systems); and, if the tensions are sufficiently diffused, it may slide over into an emotion. An *attitude* is a complex of bodily tensions, a "set" of the organism, which readily cooperates with the proper stimulus to produce acts of a certain sort, and tends to block the passage into action of contrary innervations. We are often not aware of our attitudes; the slight sensations that report them are not separately attended to, and merely blend with the cerebral complex of the moment. They may be very important, nevertheless, in determining our conduct. Interest is such an attitude, so is concentration of mind, so are

cheerfulness, a sense of propriety, and conscience. A mood is a temporary attitude, a disposition a more permanent one. Character is the sum of the attitudes existent and potential in our sensori-motor mechanism. A purpose is an attitude that lasts until, in co-operation with the stimuli which supervene, it leads to the definite, foreseen and wished result—or until other causes lead to its disappearance.

This is not a work on psychology; and the definitions and descriptions of mental processes given are not set up as authoritative. Alternative definitions and demarcations between the various types of our experience would make no difference to the argument of this volume, so long as the peculiarities of our mental life are explained in terms of our sensori-motor mechanism. The point of this chapter has been to show that even the most "subjective" of our experiences are describable in terms of cerebral complexes and their motor responses, their differentia consisting in the fact that the responses are of such a sort, in their case, that they are but vaguely projected, or left quite unprojected. Or else the data in question are called subjective because, although definitely localized by our reactions, there seems to be reason for believing that they do not really exist out there where we instinctively localize them. The fact is, of course, that the more closely we study experience, the larger the part of it becomes that we find it difficult to be-

lieve to exist in the place to which we instinctively refer it. And so the idea grows that *all* our data are purely "subjective." We have given good reasons for rejecting both this subjectivism and the pan-objectivism at the other pole of thought. The fact is that even our most "subjective" data can yield us objective knowledge of our bodily movements, of our cerebral complexes, and perhaps of the state of other bodily organs. And, on the other hand, our "objective" data, primarily used for knowledge of the outer world, can also give us, when the projective reference is ignored, knowledge of our innermost self.

CHAPTER XIV

WHAT CONSCIOUSNESS IS

DENOTATIVELY, we all know what we mean by "consciousness." It is the fact of the "givenness" or "appearance" of data to us—the term "data" meaning what we seem to see, hear, remember, think of, imagine. It is with these data of consciousness that theorizing must begin. Starting with them, we have reached a realistic belief in a world whose pattern is revealed to us in the particular data known as the conclusions of physical science, and whose substance is sentience. We must now reverse our procedure and show how, in such a realistic world, consciousness can come into being, *i.e.,* how the data of consciousness can be "given," or "appear."

Consciousness is certainly not the mere existence of sentience. Consciousness involves transcendence; it is awareness *of* something *by* something else; it implies a relation between a *here* and a *there,* a *now* and a *then.* Awareness of even our own cerebral life—*i.e.,* introspection—is a subsequent phenomenon, by no means identical with the mere existence of that inner life. Consciousness is a function of the organism consisting in the *use* of psycho-neural states as cues for bodily adjustment. The psycho-neural states are used as signs of what

the body is to adjust itself to. Consciousness is, therefore, always cognitive in form, though it is often not cognizing existents.[1]

Behaviorism is right in thinking that all the events concerned are physical events in a physical world. Consciousness is too often discussed in abstraction from a study of the living organism, whose function it is; whereas, actually, it bears in every feature the stamp of its existential basis. To be sure, physiology alone would never reveal the substantial aspect—the sentient nature—of these events. And it is this sentient character that gives the *feel* to our conscious experience. But it is the organic adjustments that give the transcendent reference, making the organism conscious *of* something. The minute events, chemical and electrical, that constitute the cerebral processes are probably not very different from events occurring elsewhere in the world; their mere occurrence does not constitute consciousness. On the other hand, when the unitary

[1] Mr. Strong is the only thinker, so far as I know, who has clearly formulated this conception of consciousness. Cf. "Givenness originates by states of our sensibility being used as symbols for objects. That which uses them is the organism, at once psychic and extended. And what they are used for is to guide it in its adjustment to objects. In so far as a visual or tactile sensation, bearing in its own nature the impress of the object, causes the organism to react as if it were in the presence of that object, in so far the object is given. Givenness or consciousness is thus no added existence, nor is it a psychical fact knowable by introspection; it is simply the meaning or intent which the sensation acquires through becoming in fact the index of the object. . . . What we really mean by 'consciousness' is this relation of symbolism *as exercised by a psychic state.*" *The Origin of Consciousness,* pp. 122-3. Italics in original. Three words have been omitted, in accordance with Mr. Strong's present view, which has changed slightly since the book was published.

cerebral process is occurring, and the organism is being adjusted by it to this or that object, it is *ipso facto* conscious, or cognizant, of the objects to which its responses are being made.

The function of consciousness has developed historically *pari passu* with the development of the cerebral processes and the movement-systems of living organisms. The human cerebrum is larger and more complexly co-ordinated than that of the other animals; and the movements of which the human body is capable are much more numerous—particularly the movements of the hands and vocal organs. But consciousness came into being long before the advent of man, namely, when an organism, whose life, like that of the rest of the world, was composed of minute psychic events, developed a mechanism whereby some of these internal events reflected the objects surrounding them, and being, because of that concomitant variation, useful signs to the organism, were used to evoke reactions adjusting the organism to those outer objects.

Consciousness is the use by an organism of certain of its internal states as signs. Still more briefly, it is the act of *meaning*. A word has meaning in a passive sense, *i.e.*, it is used to convey a meaning. But when something is actively being *meant*, there is consciousness. And words have a passive meaning only because that meaning has been actively given to them in moments of consciousness. The act of meaning is an extremely important one. But there is nothing mysterious

about it. It is simply a shorthand term for the situation we have been describing in detail. In the case of perception, an outer object stimulates a cerebral complex, which evokes a movement-system; the organism acts as if a certain sort of thing existed. We may then say that the psychic states aroused in the cerebrum are a sign to the organism of that thing whose presence the organism is taking into account. The organism, having those psychic states, means that thing. That thing is its datum.

The situation is well illustrated by the case of rapid reading. We are not conscious of our visual sensations, we are not conscious of the words, we are conscious only of the meaning. Just so, *all* consciousness is awareness of some meaning. We do not attend to our mental states, except in introspection; we attend to the supposititious objects that they mean to us. Every act, every thought is directed outward at the object, not backward at our mental states. We overlook the presence of our sentient life in our absorption in its meaning, and thus live as in the presence of what is absent spatially and temporally. These absent objects of our interest are "present to consciousness," *i.e.,* they are present to intent, present as meanings, not in body. Consciousness is the virtual presence of the absent, made possible by attention to what is meant, rather than to that which means. In this sense only is it transcendent.

Illusory consciousness arises when an organism

implies by its reaction (including verbal description as a very important reaction) the reality of something which is not real. Thereby, characteristics are imputed to the object reacted to, which do not belong to it; or the reaction is to an object which is taken to exist, but does not exist at all, or does not exist at the place and time to which the reaction is directed. Illusion is thus essentially a motor phenomenon. Psychic states are used to mean what they should not have been used to mean—should not, that is, for purposes of literal knowledge. The illusion depends, not on the mere existence of the particular cerebral complex, but on the wrong bodily activity which it engenders, whether that consists in overt and visible movements, or in those subtler movements that incipiently adjust it, whether in movements that focalize sense-organs, or in wrong description and naming. An illusion is, therefore, not a new existent entering upon the scene. It is simply a result of the fact that an existent (the psycho-neural complex) is used in a wrong way. The psycho-neural complex exists (and any one is, of course, as real as any other); the body exists, with its mistaken adjustments. But the datum wrongly assumed does not exist. An hallucinatory object has absolutely no existence, of any sort; nor have the fantastic scenes seen in dreams. Nor, for that matter, have any sensa, in their entirety. *Elements* in any sensum may be real; and, indeed, all our physical knowledge is got from sensa. But so may *elements* in dream-scenes and in hallucinatory

objects. The point is, that the *appearance* of a datum, whether in dreaming, in imagining, or in sensing, does not guarantee any existence beyond that of the body and its states. To judge how far our projective powers have enabled us to hit the mark, and become aware of what is really there, is another matter altogether.

Thus the beginning of wisdom, in epistemology, is the recognition that what we see, hear, feel, etc., we only *seem to* see, hear, or feel. That is to say, these words are all ambiguous. In one sense we certainly do see just what we seem to see. But if the word "see" is taken to mean that we are in a perceptual relation to a physical thing, then the seeing may be only an apparent seeing. In other words, the fact that we have these *experiences,* however vivid, does not, in itself, imply the *existence* of the entitites that are at the moment "before our minds."

It is a realization of this truth that has been the strong card of the various idealistic philosophies. And it is perhaps what leads some contemporary thinkers who disavow idealism to be skeptical of the fact of physical existence in the realistic sense. Thus Fullerton repeatedly defined "physical existence" in some such terms as "whatever belongs to the Objective Order of experiences." He even labeled this view "The New Realism."[1] But this view is not realism in the generally accepted sense

[1] See his essay of that title in the James memorial volume and his essay on "Things" in the *Journal of Philosophy,* vol. XXII, p. 29.

of the term, the sense in which the term is used in this volume. It is an anthropocentric view of the physical world. Whereas our view is that things have an existence of their own, and would have it just the same if there never had been any conscious beings in existence. However, it is possible to be genuinely realistic in outlook and yet to realize that thinkers like Fullerton and the idealists have been on the track of a truth which most realists fail to grasp, *viz.*, that realism (in the accepted sense of the term) is a hypothesis, not a certainty in the sense in which the appearance of our data is a certainty, or in which logical and mathematical truth is certain. Consciousness is a perpetual *assumption.* In some of its forms, as in dreaming, we have become sophisticated enough to reject the assumption and admit the fact of illusion. So even in waking hours we discount many of the deliverances of consciousness—the apparent smallness of distant objects, the apparent bentness of the dipped oar, etc. And it is not surprising that subjectivists are led to reject *all* the objective references of consciousness as illusion.

The correction of one error usually leads, in philosophy, to devotion to a contrary error. So we find some of our acutest thinkers, like Mr. A. O. Lovejoy, who discriminate clearly between the data of consciousness and physical existents, insisting that our data are psychic existents. Each datum appears at a particular moment, and thus they can

be grouped in temporal series and given a locus in time, though not in space. Why should not this status be dignified by calling it one kind of existence? Our answer is twofold. First we prefer to reserve the name "existence" for what has a locus in both time and space, and is a part, thereby, of the causal order of nature. And, secondly, there *are* existents, in every case of conscious experience, which contribute all the *feel* to the experience, all that makes our data seem so irresistibly real that the denial of existence to them appears to these thinkers a paradox.

I venture to suggest that these philosophers may have been led astray by the fact that our cerebral states (whose sentience is *our* sentience) do not normally attract attention to themselves. They evoke adjustments as to events external to themselves; and our reflection, analysis, and description (except when we are introspective) proceed on the basis of this self-effacement. For example, the descriptive terms evoked may be "far away," "very big," "heavy," etc., none of which epithets apply to our mental states, but only to the object posited by the body's reactions. Our data are not what exists, because our data are the counters of our discourse, and in discoursing thus and so we are falsifying reality. That is, it is falsification if it is taken to be the description of our mental life. But, of course, it is not intended as that, it is intended as a description of outer reality. And as such it may be beautifully true. Thus perception

involves self-forgetfulness; we lose one reality in order to find another.

Even in what we call "introspection" we do not instinctively or easily refer our data to the inside of our heads. We should not feel our mental life to be in our heads unless we had motor responses of such a sort as to localize it there. But such motor responses we have had no need to develop, and have not developed. So it is not surprising that we do not feel our mental life to be where it is. No existent, we must remember, feels itself to be where it is; it is just a bit of feeling, and that is all. All that introspection does is to check or discount our instinctive tendency to localize what we are aware of at the point from which the stimulus comes, and to describe the data of our awareness with this projective reference ignored or corrected. This often involves correcting much of our description, so that we become aware of quite a different object. For example, instead of being aware of "the immense sun," and "this comparatively small dollar," which might be my data while I was in the perceptive attitude, I should now be aware of "a round dazzling disk, smaller than this silver-colored disk." Giving up the differences in the attributed position of "sun" and "dollar" involves giving up the difference in attributed size; in the case suggested, seeing the silver disk as actually larger than the sun-disk. Or, if the dollar is held slantwise, my datum is, while I am in the perceptive attitude, "a dollar held slantwise to my eyes," and, when I

am in the introspective attitude, "a silver-colored ellipse."

"Introspection," unfortunately, is not a good word.[1] It points, indeed, to the fact that we are trying to describe our mental life itself, instead of using it to describe the things we are looking at, feeling, etc. But we cannot possibly describe it accurately. We can not react to its fine parts, or its rapid succession of events. And we can not really get away from our instinctive projective tendencies. So that introspection always remains far from completely successful. We discount our perceptive tendencies, to a degree, sharpen our attention to the details of our data, and think of them as our sensations. But there is still, as in perception, a great difference between what is given introspectively and what exists, between our data and the existents as they are. In both perception and introspection we must distrust the veridicity of our data, and subject them to a drastic conceptual revision, if we would hope to reach accurate notions of anything as it really is. But it takes patience and training to discover beneath our world of immediate appearance the nature of existence itself. And even when we have unravelled the complicated existential situation in reflection, we shall cease to be aware of it in our ordinary hours. We shall continue to

[1] If I had had Mr. Broad's book on the Mind before writing this volume, I should have adopted his felicitous term *inspection* for the case where we are merely observing the characters of our data without referring them either to physical existents or to our mental states. (*Vid. The Mind, etc.*, p. 291, etc.)

be aware of what our perceptual, or our introspective, processes present to us. We must perforce *live* in the world of Appearance rather than in the world of Reality, though in our scientific and philosophic moments we may penetrate beneath the illusion. The world of Appearance coincides to a considerable extent with the world of Reality; but to find out in what respects requires acute discrimination and patient research.

The fact is, our minds need to be severely trained, if they are to serve the interests of knowledge—knowledge even of what is confronting us; or rather, most of all for knowledge of that. For our minds run away with us. Not only intelligence, in the narrower sense, but all consciousness, is in a sense creative. We must realize that the appearance of even the simplest datum to consciousness is the result of a complicated organic process. This datum *may* be, wholly or in part, the existent which the organism is trying to know; so felicitously ordered is the cognitive process. But, again, it may not be. And if it is not, it is merely a mistaken assumption, merely a supposed object that we were reacting to; it is what we thought we saw, what we remember ourselves as having seen, what we report and describe.

The datum of consciousness is thus a "concretion in discourse," which bears the marks of mistaken reference, of wrong description, and is therefore an imaginary entity. An imaginary entity *with a circumstantial basis in existence,* of course. There

must have been just such sensori-motor events as constituted our act of supposing, describing, remembering, or whatever. Those events have their inner *feel;* and there is a relationship in detail between their spatio-temporal pattern and the characters constituting the datum of consciousness. But it is nevertheless a mistake to call the psycho-neural events the data of consciousness. For that name must be reserved for the supposititious objects which appear to us; every one knows what *they* are; and they are obviously not "psycho-neural events," but whatever they happen to be. It is they that usually get all the credit for existence. But these rainbow dreams of ours are the sham realities, while the humble stay-at-home cerebral events and the atomic and electronic events outside the body are the real living forces, at once psychic and physical. They make up the existent world, while the data of our experience, so far as they are something different from these, belong merely to the realm of appearance.

But alas! most philosophers today, whether realists, idealists, or pragmatists, take the contents of consciousness—whether they call them physical or mental—to be unmistakably and evidently existent. That is the obstinate mistake of current philosophy, which keeps it groping confusedly, "in wandering mazes lost." It has not always been so. Plato took the data of consciousness to be phenomena, appearances, and looked behind them for reality. So did Kant. So did the philosophers of the Absolute. But

they did not know where to look for reality, and so they constructed supposed Real Worlds more imaginary than those from which they started. The Real World is all about us, and we are part of it. Science long ago found a way to discover it, and has gone ahead, laboriously studying, correcting, interpreting the data of experience and gradually creating thus a body of *revised* data, a systematic and consistent set of concepts which undoubtedly constitutes, so far as it goes and allowing for incidental mistakes, a correct knowledge of the existent world.

Scientists have, of course, often misunderstood the philosophical implications of this procedure, and have said many silly things when they left their laboratories. But they have been right in the procedure. And philosophy must adopt a more conscious use of this same procedure. It must discard secondary qualities from nature just as resolutely as the scientists have done; not merely on pragmatic grounds, because for particular purposes it "works" to discard them, but because it has decided that they are not there. It must proceed in this same way in its study of the mind. For a mind is an integral part of nature, and its events no more have secondary qualities than any other natural events. Philosophers and scientists have usually been at odds. But scientists have been right, as their wonderful success proves; while philosophers have been wrong, as their conspicuous lack of success should sufficiently demonstrate.

So the behaviorists are after all essentially right.

All the existents concerned in a case of consciousness can be described (that is, could be if we had enough physical and physiological knowledge) in physical terms. Such a description, to be sure, always leaves out of account the inner nature, or substance, of the events it records. And so the fact that conscious experience has a *feel* to it fails to be conveyed in behavioristic writing, as it is, vaguely, in the writing of introspective psychologists. This omission is disturbing to those who are used to the traditional psychology. But just because we happen to know that our conscious life has a feel to it we need not blame the behaviorist for ignoring it, any more than we blame the chemist for not telling us the inner nature of the life of the chemical elements, some of whose activities he records.

If the behaviorist ignores the data of consciousness, as such, in his reports (of course he does not ignore them in the sense of not using them, for he can not take a single step without using them—they are all that he, or anybody else, has to use), it is because he is interested not in the world of appearance, in what we take ourselves to have experienced, in the data of consciousness as such, but in the world of existence, the ground of these appearances. This too is legitimate.

Moreover, the behaviorist may describe every *existent* concerned without using the concept "consciousness" at all. For, as William James correctly said, consciousness does not exist. It is not something you could find in the brain or outside it.

Consciousness is a *function* possessed by a sentient organism. The term is a shorthand one for describing a complex series of events of a certain type, and the relations which subsist between them. It is a large-scale phenomenon, requiring a certain amount of time and space. It is just such sets of events that the behaviorists are trying to describe in detail. Their general nature and differentia it has been a task of this volume to define.

CHAPTER XV

THE REALM OF APPEARANCE

We are now in a position to see clearly why the data of consciousness have, as such, no existence; why this third category of cognition dissolves, upon analysis, as we said in our opening chapter, into states of the knower, on the one hand, and the object on the other hand. The data of consciousness are *meanings;* they are the ideal terms in view of which the organism adjusts itself. What carries the meaning is the complex of psycho-neural states, and the motor responses it evokes. In so far as consciousness gives us *knowledge,* it is because the meaning, or datum, concides with a reality, *i.e.,* the organism is adjusting itself not to a merely supposititious object, but to an object that is really there to be taken account of.

Our perceptual data are the qualities and relations which we ascribe to physical things at the moment of perception. How far these characters do belong to the existents with which the body is dealing cannot be decided by describing the data themselves; it can only be decided by comparing the data of various times and constructing such a consistent picture of reality as will explain the peculiarities of our experience in detail and as a whole. And this is, of course, the procedure of both physical

science and psychology. When it turns out that certain characters of our data—*e.g.*, the color-qualities —find no place in our world-picture, these characters must be taken to have been mistaken meanings; nothing of that sort exists. They are false attributions, mere items in our discourse, having an important symbolic truth, but not literal truthfulness about any existent. These symbols may have great practical value, as shorthand accounts of reality; but they are none the less illusions.

It will still be difficult, doubtless, for some readers to believe, in spite of the overwhelming evidence of reflection, that a sensum may be a purely imaginary entity, a mere concretion in discourse, without either physical or mental existence. Some such question as the following will persistently recur: "Do you mean to say that this red rose that I see so vividly before me is a mere item of discourse? Here it is, in front of my body: how can I doubt it?"

Once more, then, before we leave the matter, let us consider. You can not be sure that this object, or anything like it, exists in front of your body, just from the fact that it seems to you to be there. People do have hallucinatory experiences, vivid dreams, experiences when hypnotized, in which they clearly see before them objects which they come to believe were not there. And even if, because you also touch the rose and smell it, and because other people report similar experiences, because scientists study it in detail and describe its life-processes, you have every right to believe that *the rose* exists,

you can not be sure that the "red" is a part of its nature. *That* element, at least, in your experience may be illusory. We *are* subject to optical illusions, any number of them; this may be a type of illusion so common, so universal, that we overlook its illusory nature. And as a matter of fact, we have noted the very convincing arguments which show that this is, indeed, the case. It is altogether probable that the physical rose is not, in the sensuous sense, red. So that the datum "red rose out there" is, as a whole, a fiction, an imaginary character-complex.

But whether or not the physical rose is red, or exists at all in front of the body, does not this rose-shaped red patch have external existence? No, we have seen good reasons for discarding that suggestion. Such objects of consciousness appear when, and only when, the brain is stimulated; indeed, they are largely "recalled" from within the brain. They have no way of getting out into outer space, and would have an utterly mysterious and unintelligible tenure of existence out there if they could get there. So the out-thereness of the datum belies the truth about the inner states that you are having. The sense of out-thereness is a resultant of the occurrence in you of certain complex sensori-motor events; but the predicate "out there" does not apply to those events themselves.

It is evident, then, that the characters of our data may not have existence of *any* sort. If it is a case of dreaming or hallucination or perceptual error, the predicate "out there" applies neither to a

physical entity nor to a mental one. That character, at least, of the datum is imaginary.

The term "rose," likewise, would apply to nothing real, in the case supposed. "But is there not a *mental* rose?" No, for a rose—the particular rose, at least, which is your datum—is a thing growing on a stalk and nodding in the breeze. And roses do not grow on stalks or nod in the breeze in your head, or in any "mental realm." "But is there not a mental *picture* of a rose in my mind?" No, for it is only as the numerous sensory elements in various parts of your brain join in evoking certain adjustments of your body that the "picture" is formed. The "picture" is the *product of projection,* and is seen out there in space. It is merely your datum. If your body were not acting as if there were a rose in front of it, no vision of a rose would present itself to you at all. No "picture" *exists* anywhere—only the psycho-neural events generating behavior and discourse, and the rose itself, if it exists.

"But surely the *red* exists in my mind?" No, the character "red" is in the same case with the character "out there." You have a specific complex of mental processes, which leads you to act and talk and remember in terms of this particular epithet "red," just as certain other mental processes, ingredients in the total complex of the moment, lead you to talk and think in terms of "out there." But the epithet "red" does not apply to the mental processes any more than the epithet "out there" applies to them. We can, indeed, talk of the mental

processes as, respectively, "a sense of redness" and "a sense of out-thereness;" but these would be but names for highly complex sets of events, describing their function rather than their nature. This "sense of redness" would be analysable into a pattern of psycho-neural events, with specific motor connections; none of these existents could properly be called "red." Just so the "sense of out-thereness" could be analyzed into another complex of sensori-motor events—eyeball-movements, tentative tactile sensations, etc., none of which could properly be called "out there."

As we noted in another connection, our data of consciousness, as such, are not analyzable. Not only "simple qualities," but every datum, is just what it appears to be. For this is the realm of appearance. The quality "purple" is not a composite of the quality "red" and the quality "blue;" it is a specific essence, or logical entity, as individual as the quality "red." The datum "out there" is not a composite of the various kinesthetic sensations which cause that datum, or aspect of a datum, to be "given." Even a seen landscape or a heard melody is, *qua* datum, unanalysable. When we, as we say, analyse our experiences, we are really substituting other experiences for the original experience. What happens in analysis is that we use separately, for perception or introspection, mental states which before the analysis we used fused. A limit is set to analysis, in either case, by the inability of the finer parts of our mental life to evoke separate reactions.

So that in any case the datum is set before us by a very complicated process. The mental complex that is the basis of our discourse concerning "purple" is evidently composed of two sets of events, one of which, apart from the other, would lead to our discoursing about "red." And *that* set of events is, in turn, composed of no one knows what minute parts. The total complex of minute feelings *is* not existentially "purple," nor is the component set of feelings "red." "Purple" and "red" are labels we affix, convenient and symbolic terms of discourse, pointing to facts which are far too complex to be grasped except in such a symbolic way.

You cannot possibly catch, remember, or immediately apprehend in detail this great mass of incredibly minute and rapid events that makes up your throbbing sentient life. Nor can you catch the equally minute and rapid events that make up the life of outer reality. Such detailed knowledge would not be practically useful in your animal career; your body moves too slowly and on too large a scale. Hence masses of this inner life incite your body to act with reference to masses of outer reality. Your inner life is sentience, the sentience you know you have—this is the unmistakably real element in experience. But the terms which we apply to it and to the outer reality are often only symbols; the descriptions we thus formulate are only in certain traits and lineaments literally real, the rest is mere label.

We have noted the ways in which, in varying de-

gree, we *mean* characters that are not characters of the existent psycho-neural events which carry the meaning. Those events are always extremely complex, yet we often mean a simple object. They are always here, inside our bodies, yet we often mean a thing or event in the outer world. Only an instantaneous cross-section of these processes exists at any instant, yet we often mean something lasting. Each minute event is separate, existentially, from every other event that goes to make up the complex psycho-neural process, yet we often mean a group taken as a whole. Simplicity, out-thereness, the felt-togetherness of a series of events, the spatial felt-togetherness of a scene—these are characters of our data, not of the psycho-neural events. *How* we can mean these characters has been explained in some detail. The organism means them by its way of reacting. And particularly by its language-habits. Animals have data of consciousness, *mean* this or that, without using words; but words crystallize and embody meanings, give them fixity, make it possible to recall them and to communicate them to others with far greater accuracy.

Sensuous quality, such as color, illustrates most conspicuously the pseudo-simplicity that characterizes most of our data. There usually is a physical thing that we are looking at when we have the experience of color. But *it* is not colored, in the sensuous sense of the word "color." And it is perfectly possible to see color when our eyes are shut—notably in the case of vivid dreams. In all cases

there is a psycho-neural process going on. But *it* is not colored, either. The complicated psycho-neural process evokes an equally complicated motor set of the organism. And of course *it* is not colored. But the organism acts as if in the presence of something simple; it takes account (in so far as it is merely perceiving a color) of just one trait, or essence. There are many different cerebral patterns, evoking as many different motor sets. Each motor set is *as to* something simple, but the simplicities are not identical. Each such simple essence is a "quality." How else could the organism have solved its problem?

But colors (and other sensuous qualities) are more veridical than the foregoing paragraph, taken alone, would suggest. They are usually veridical in a symbolic manner with respect to the things perceived, enabling us to deal discriminatingly with them. And they have a still greater veridicity with respect to the psycho-neural states, when we try to introspect them. The psycho-neural states actually possess the characters that our color-data possess, *except for the simplicity of the latter.* Sensuous qualities are merely a simplification for intent of the unimaginable complexities of existence; they are existence blurred, fused for handling. Thus they are not brand-new creations; there is merely omission for consciousness of multitudinous detail.

Essentially the same thing happens in all cases of consciousness, though we use the term "quality" usually only in certain cases. We speak, for ex-

ample, of "Europe." But all that *exists* over there is—an inconceivable number of atoms, flying about in inconceivably complex courses. There is, existentially speaking, only this atom (or electron, or whatever the ultimate unit is), and that, and the others; or, perhaps we should say, the events that make up their life, in a certain spatio-temporal order. "Europe" is a term of discourse, a label that covers a multitude of facts, a simplification for practical human purposes.

So an emotion, such as "fear," is, as we have seen, a term of discourse. Existentially there are a multitude of psychic states and a multitude of muscular and systemic events. You could never find the emotion itself anywhere in the existent world. But we can deal with this organic complex as a unit, understand its causes and effects and its sentient character as a whole. It is in this *taking as a whole* that the concept of an emotion arises. The term "fear" is a useful label to apply. But no "fear" *exists*—only the particular type of pattern of multitudinous events.

The case of "red" is similar, except that in this case we know even less well what the minute events are that we cover by our term.

This, then, is the "realm of appearance." It is a realm of "discourse," consisting of all those characters, or essences, that we imagine, suppose, impute, talk about. It is a part of the wider "realm of essence." Anything that *could* be imagined, or that might exist, any describable somewhat, is an

"essence." And of course there are (subsist) an infinite number of them. The world of existents, vast as it is, is but a speck in comparison.

But now, *some* of these essences are "given" to conscious beings, *i.e.*, are thought of, imagined, seen, heard, etc. This class of essences actually "given" (the data of consciousness, what I call "appearances") is a class far smaller than the class of essences. The class of data of consciousness overlaps the class of existents, but includes many essences that are not existents, just as the class of existents doubtless includes many essences that are not and never have been the data of anyone's consciousness.

Every particular existent is the existential embodiments of some particular essence. Any other existent would be the embodiment of a different essence, were it only in respect to its number or its position in space or time. But any essence, however particular, can be "given" over and over again—as often as any one can think of it. When the same item is thought of, or perceived, by different people, it is correct to say that their data (the essences "given" to them) are identical. But this does not involve an existential identity between any parts of the life of the various people. None of the people concerned includes within his own existence any part of the life of the thing thought of or perceived; for that thing exists at a different time or place, or both, from that of any perceiver. But all the people can perceive it or think of it; it can be, in various

degrees of detail, the object of their awareness, the essence given to them.

It is important to remember that the realm of essences is not quasi-existent. There is no mysterious heaven where Plato's "ideas" have their abode. These ideas, essences, characters, logical entities, are merely possibilities of existence, and possibilities of discourse. Some people, interested only in the world of existence, scorn this conception. But it is an extremely useful one. Using it does not turn our existential universe into a multiverse. On the contrary, it is only by recognizing the distinction between essences and existents that we can come to see that *existence* does make up a universe rather than a chaos.

When we speak, then, of the "realm of appearance," we merely mean that human beings act and talk as if in the presence of essences which do not, *ipso facto,* exist. But this fact of living as in the presence of essences which (to a large extent) do not exist, or do not exist here and now, is one of the most important facts about human life. The imaginative recovery of the past, the anticipation of the future, the perception and conception of what is absent, the conception of the non-existent, have long been seen by philosophers to be incompletely describable in terms of physical events. And so a "subjective" realm has been conceived into which the superfluous entities can be put. But, as most realists have seen, if this is also an existential realm we not only do not solve the problem, we make it

far more difficult to solve. Only by formulating (in whatever terms) the conception of a realm of appearances or data of consciousness, and clearly recognizing what we mean by the concept, can we solve this most obstinate of human puzzles.

CHAPTER XVI

THE UNITY OF CONSCIOUSNESS

The cerebral events that determine the adjustments of an organism are highly complex. The existing things to which these adjustments are made are highly complex. All these existents form part of a continuous physical world. Yet the data of consciousness are relatively simple, and have a sort of unity and isolation. That is, there is a sort of "compresence" of their elements, which contrasts sharply with the chasm that apparently separates them from everything else. We take in, in one act of awareness, the successive parts of a melody or spoken sentence, or the details of a spread-out landscape. But in both its temporal and its spatial aspects, the field of consciousness is, at any one moment, sharply limited. And the aspects of reality of which we are at any one moment aware are the merest fraction of the existent reality which is the objective of the cognitive relation. Consciousness is, in fact, a method of dealing with reality through various simplifications, the actual complexity of reality, both inner and outer, being so great that it must be simplified in our apprehension if we are to deal with it. But how this simplification and unification and isolation of the data of consciousness can be effected has been a long-standing puzzle to

metaphysicians; and not a few have been led by it to a spiritualistic or transcendental metaphysics. We must, therefore, show how, on our theory, these effects are the natural outcome of the situation that engenders consciousness.

If the data of consciousness were merely, as some contemporary realists suppose, portions of the physical world, it would be difficult to explain their unity or their isolation, or both. For the physical world is pluralistic, *i.e.*, composed of countless separate units. And on the other hand it is, in a sense at least, continuous; *i.e.*, there are no such chasms in it as separate what is within a field of consciousness from what is without it. The compresence of just so many elements and no others in a single field of consciousness is a fact not to be found in the physical world, not included among the facts of any physical science. And the fusion whereby a multitude of details are apprehended as a simple quality is also not a physical fact; the reality apprehended by us in the form of a simple quality is always enormously intricate. It is not that the constellations of whirling electrons and protons that make up a blackboard, for example, have another existing entity, a black color, smeared over the outer boundary of their outermost orbits; there is no color there at all, except in the sense of oscillations of a certain rate. And a similar remark is true of the cerebral constellations. In short, the unity, isolation, and simplicity of our data are not existential facts, either physical or psychical. They are terms

that apply to the data of consciousness as such. These data are our meanings. Their unity is conferred upon them by the unitary nature of a reaction-system; their isolation is the result of the fact that just this spatial or temporal group and nothing more is what the organism is reacting to; their simplicity is due to the inability of the organism to follow up the fine details of its cerebral life with separate motor responses, so that a mass of events has only one meaning for it.

The relative simplicity of our data we discussed in Chapter IX, under the head of fusion. Fusion, we there pointed out, is a fact of cognition, not a fact descriptive of the reality cognized. Whatever variety there is in the field of consciousness at any moment is due to the fact that numerous incipient adjustments are simultaneously being made by the organism. But the great mass of details can not evoke separate reactions, so they escape our notice. The organism can not deal with very complicated entities, it has to act with reference to relatively large outlines and masses. The data of consciousness are the organism's meanings, these simplified features of reality. Our inability to react to the details separately, and our consequent thinking, remembering, and discoursing in terms of large masses, is the correct account, we may safely say, of what psychologists call fusion.

But in exactly similar case is the so mysterious Unity of Consciousness. We react as to a single object, or scene, or event. The singleness is created

by the act. The compresence of elements in a complex datum results from the fact that the organism is attending to just so many details in one simultaneous set of motor responses. Their isolation results from the fact that the organism is adjusting itself to nothing else at the moment.

It is obvious that we see just such an expanse of landscape as we do see, and no more, because our eyes can receive and transmit to our brains only certain impressions, at any one moment, so that our cerebral complexes contain only corresponding elements. And the boundary of our introspective field is equally explicable. The psycho-neural processes in the cerebrum are not isolated physically from surrounding and interpenetrating events, such as the activities that consist in the conveying of blood and repairing of tissue. And it is natural to ask why these other processes—composed, like all matter, of psychic stuff—are not included in the inner life of which we are aware in introspection. But it is easy to see that there is a *functional* isolation of the psycho-neural processes which make up the cerebral arcs, in the midst of the other processes going on in and around the brain. Just these neural currents, and nothing else, determine those adjustments and reactions in which introspection consists, and so the data of our introspective awareness. Everything else, however physically near, remains outside this co-ordinated process, and has no share in evoking our introspective reports. So in dreamless sleep or when the brain is drugged with chloro-

form or ether, although there is much activity, of a sort, in the brain, there are no completed sensori-motor arcs, and so there is no awareness of anything.

Sentience, of course, there is, during dreamless sleep or anesthesia. But sentience that can not be remembered or talked about has no part in making up our experience. What elements of feeling go to contribute something to our experience is determined not by their nature but by their function. There are innumerable psycho-neural events in our brains that never get into the big game, never affect our behavior, and so remain outside our memorable life, never give rise to any items in our discourse. Some of these events may even evoke bodily movements through dissociated sensori-motor arcs, and yet remain outside the common pool of memorable mental life, for lack of an associative bridge by which they can be recalled. . Just as I can not remember what has gone on in your mind, so I can not remember what has gone on in my own mind, except as these events have been bound up by neural conduction with the mainstream of my cerebral life. Only what can be reached by way of these neural connections—we call it the association of ideas—from this central core of our being, is our permanent possession, the existential basis for our accumulated "experience." The "accumulation of experience" is a fiction, as are most of the terms of our discourse. But it is a symbol for an important functional fact in our organic life.

The synoptic power of consciousness, both spatial

and temporal, is thus the result of the functional unity of a co-ordinated sensori-motor process. The cerebrum is, precisely, an organ for co-ordinating the immediate and past impressions of the organism (the latter, of course, through their effects in the present), and making this complex an integrated cause of the body's movements. It has developed processes of conduction from center to center which cause it to function normally as a unit. Just what movement-system shall be evoked is determined by the convergence of the motor tendencies, congenital or acquired, of the various sensory events excited at the moment. Usually, no doubt, there are divergent tendencies, and sometimes their conflict is very sharp. But opposed muscular reactions are simultaneously impossible, and therefore conflicting tendencies tend to block one another. If the opposing tendencies are evenly balanced, indecision and inaction result. But normally the minor tendencies are simply checked by the dominating tendencies, and action proceeds in the direction toward which the most numerous or most strongly excited elements exert their push.

The functional unity of the cerebral processes is not, indeed, absolute. Any vividly aroused set of sensory states tends to draw whatever other sensory elements are simultaneously excited into one unitary movement-system. But sensory events often, doubtless, coexist outside this main system. Certainly, when the principal sensori-motor arc is comparatively shrunken, as is the case in automatic

action, where comparatively few elements (largely kinesthetic) determine the body's movements according to an often rehearsed successive-movement system, other sensory events may not only coexist but may form coexistent systems, with their own motor expression. It is necessary, to be sure, that the two sets of motor activities shall not interfere with each other; and this puts a sharp limitation upon the possibilities of coexistent sensori-motor systems. But—for example—we can walk, or play the piano perhaps, and carry on a conversation at the same time. Some people, who tend, more than others, for some not clearly understood psychological reason, to form comparatively restricted movement-systems, can even carry on a conversation about a subject while one of their hands is writing a message about another matter. Or the dissociation may result in two or more sets of independent sensori-motor systems having alternate control over the body without association between them, so that while one system is functioning no memory can be had of the events that occurred when the other systems were functioning. But in so far as there is dissociation between sensori-motor systems, there is a breach in the unity of consciousness. In the extreme cases it amounts to multiple personality. It is clear, then, that the unity of consciousness depends upon the co-operation of the psycho-neural processes, their convergent production of a unitary movement-system.

When we converse animatedly while walking, we

are apt to say that we are unconscious of our walking. The more vivid stream of mental life which the conversation required leaves relatively enduring traces; thus we easily recall what we thought and said. But from this set of processes there is no connection to the comparatively thin stream of psycho-neural life that was controlling the walking. The dissociation is complete in the case of activities controlled by extra-cerebral arcs. But even when the automatic movements involve cerebral activity, the two sensori-motor systems may not be associated. If, however, there are moments of hesitation in the automatic movements—if we stumble when walking, or make a mistake in our piano-playing—we may be able to remember the experience, because at that moment the gap between the dissociated processes was bridged.

What we can remember is, obviously, all that we can ever directly know ourselves to have had as a part of our experience. But we must be wary of supposing that what we cannot remember was not a conscious experience at the moment. The degree to which our experience is recallable in memory is a measure of its permanent usefulness to us. But evanescent consciousness may play a very useful part at the moment of its occurrence, even though, because the cerebral events lacked volume or vividness, and therefore failed to form associations with the mainstream of our mental life, it may not be revivable in memory. And doubtless a large part of our conscious experience is in that case. We

never remember, and therefore quite fail to take into account, a great deal of our sensori-motor life of the habitual, routine sort, as well as that of a trivial and uninteresting sort.

Some psychologists have recently stressed the *lack* of unity of consciousness. They call attention not only to the less usual cases of dissociation, but to the isolated fears, worries, fixed ideas, and "suppressed desires" that seem to be very common psychological phenomena. In many of these cases what exists is not a complete sensori-motor arc, such as could give us a conscious experience of fear, desire, etc., but merely a slight but persistent local psychoneural activity which, if reinforced by some stimulus or associated process, *would* evoke a motor response and give rise to the conscious idea or emotion or desire. It would be more accurate, in such cases, to speak of suppressed tendencies to desire or worry or fear; their motor expression is blocked by conflicting motor responses, or does not come into being for lack of a sufficiently strong push from the sensory elements. But in other cases the local activity cut off from the mainstream of the cerebral life does find intermittent bodily expression which, though unknown to the patient because of the dissociation, may do bodily harm, and thus perhaps indirectly affect the mainstream of mental life. Happy experiences may leave lingering after-effects in the cerebrum which affect our spirits for days, though we do not consciously recall them. And horrible experiences, sorrows, and anxieties may poison our

happiness for years without our knowing why. In such cases the effects are often partially or wholly ended by bridging the gap, associating the local activity with the rest of the psycho-neural activity, and hence stopping its separate motor expression. This can be done, to a degree, by psycho-analysis and suggestion.

As a matter of fact, there is an enormous amount of *dis*unity in our mental life. This is as intelligible, upon our theory, as the degree of unity which we find. But it is a stumbling-block for those who believe in a transcendental principle of unity or an unextended Soul as the *sine qua non* of consciousness. In cases of lateral dissociation, does the Soul split up? Does the transcendental principle of unity fail to function? Or if "suppressed desires" can exist unknown to the patient, is it a case where, so to speak, the Soul's right hand does not know what its left hand is doing? The fact is, the Soul was invoked to explain the unity of consciousness, and is not adapted to explain its disunity; whereas our explanation, in terms of physiological psychology, applies with equal ease to the unity and the disunities of consciousness.

But there is a further complication to the situation. Even within that complex of cerebral elements which determines the main bodily reactions of the moment, some are more vividly present to *attention* than others. Attention consists, in the first place, in the occurrence of a set of incipient and overt

movements aroused by certain sensory states within the total complex existing at the moment. This specific attentive reaction consists largely in adjustments of sense-organs and bodily posture, cessation of distracting movements, and certain useful systemic changes, as in the respiration and circulation. It is the sensations produced by a return-wave from these muscles and bodily organs that give us the sense of attending.

The result of the attentive reaction is an increased activity in the parts of the cerebrum involved, a greater fullness of detail brought into existence by this activity, an increase in the intensity and dominance of the motor responses evoked, and thus a greater vividness in the data of consciousness. As our attention fluctuates, owing to fatigue, to changes in the outer stimuli, or in the states evoked by association, different parts of our total psycho-neural complex develop detail and become prepotent in determining the direction of the motor flow. Incompatible attentive reactions are not simultaneously possible, and hence the field of attention is at any moment sharply limited. And there is usually a considerable amount of mental life in addition to that which evokes the attentive reaction. Attention thus makes a specially favored group of psycho-neural elements dominant, within the larger group that has functional unity. All the other sensory elements within the larger group are "marginal," forming a sort of blurred background. This, I suppose, is what impresses Mr. Whitehead

when he says that "Nature as perceived always has a ragged edge." (*The Concept of Nature*, p. 50.)

The unity of consciousness is thus based upon a functional unity of the attentive process, within that total process of impression and reaction which has its own larger functional unity. The multiplicity of consciousness is based upon the multiplicity of the motor adjustments incited by various co-existing sensory elements. The datum of consciousness has a corresponding degree of unity and multiplicity. Thus the matter is far less simple than it seemed to be to those who first discussed the unity of consciousness. There is the functional unity of the co-ordinated sensori-motor process that is controlling the organism at each moment, there is the similar unity-within-a-unity of the attentive process, and there are varying sorts and degrees of disunity from moment to moment. The varying unity and manifoldness of the data of consciousness result directly from the nature of this varying existential situation.

CHAPTER XVII

THE SELF

In the course of our argument we have occasionally used the terms "Self" and "Knower." And we have often implied the existence of a Self or Knower by the use of such terms as "given" and "appearance." For the question is natural, Given to whom? Appearing to whom? And we must not close this discussion without pointing out that our use of such terms is justified by our realistic view. It is not a mere grammatical peculiarity of language that leads us to say, "I perceive, I think, this is my experience, my desire, my will." You and I are persons; we have personality, and our conduct bears its impress. We are not mere "streams of consciousness" or phenomena of experience, we have a substantial existence, even when we are asleep. As in so many other respects, here too our theory keeps in touch with common-sense. Of course you and I exist, see, hear, know, love, and suffer. The fact is that our theory alone enables us to see clearly what the Self is. On other views it disappears entirely, or it remains a mysterious and ghostly entity whose relation to nature is unintelligible; or else a belief in the Self leads to the reduction of nature to a phenomenal status. But for us, both are objectively real; the Self is an inte-

gral part of nature, born in it in a natural way, and functioning as an intelligible phase of its life.

The term "Self" means "same." This may be taken to mean that in self-knowledge the knower and the known are one; or it may point to the permanence of character and continuity of life of the Self. The Self retains its identity in whatever environment it may be placed. And it is almost always able to cognize itself, during waking hours. It is possible at any time for me to perceive this familiar organism that perceives and acts, that bears my name and has a life-history that I know so well. It is possible for me to introspect the mental life of this one familiar organism; even, in revived form, many of its past experiences. Self-knowledge is not the primitive form of consciousness, but it is a very important form of developed human consciousness. And however literal or symbolic this knowledge may be, and however it may be mingled with error, there can be no doubt that the objective of our cognitive act, in self-knowledge, is an actual existent. For the reasons already sufficiently elaborated, and because of the unevenness of memory and inaccuracies in our mechanism of report, we often have erroneous ideas even of the immediately passing events of our mental life. Our memories of more distant events and anticipations of our future conduct are still oftener far from accurate. For self-knowledge is still knowledge; that is, it is transcendence, awareness, report, description. In the case of self-knowledge, the knower is, in the larger sense, one

with the Self that is known. But the events that constitute the act of introspective awareness or memory are not the same events that are known.

The events in the life of the Self that yield self-knowledge are similar in their general aspects to the events that engender any form of consciousness. There must be sensory events and motor adjustments. The latter must be of a special type. They must not be of the sort that "project" the data of consciousness into outer space. Most often, our kinesthetic and visceral sensations (of which we have an enormous and continual stream) are not projected, but are either not noticed at all (*i.e.*, do not evoke an attentive reaction, and do not become so heightened as to form separate associations and get remembered), or, if attended to, are referred to the Self, are used as signs not of outer events but of our inner life. This is legitimate, because our organic sensations are much more personal than the sensations produced through the sense-organs; they reveal the nature of the brain and body of the person involved, rather than the nature of the outer world. But any sensory or image-events can yield self-knowledge, if the instinctive projective reference can be ignored and the reaction following upon them is an adjustment to them as sensations of the perceiver rather than as outer objects perceived.

The knower, then, in any particular act of knowing, is the set of sensori-motor events that yields the knowledge, whether the knowledge is yielded in the form of, say, verbal formulation, or correct vis-

ualization, or outward behavior that *implies* correct knowledge—behavior that "works," because it is accurately adjusted to the nature of the objects dealt with. But separate acts of knowing form part of the series of sensori-motor events of a single organism; earlier acts of knowing affect later acts. There is continuity of life and relative permanence of character. So the Knower is, in the larger sense, One. Each such Knower is sharply separated from other Knowers. Each is limited in powers by the resources of the particular organism in question.

The Self known is one with the self-knower, but far wider. That is, while acts of self-knowledge are always part of the life of a Self, there is much in the life of the Self besides acts of knowing oneself. All the conscious life of the Self is vaguely or clearly cognitive in form, for consciousness *is,* in the broadest sense, cognition. But most of our consciousness is of the world about us rather than of ourselves.

Throughout all our dealing with outer objects, however, we are likely to be more or less dimly conscious of ourselves. Vague and marginal self-consciousness is not deserving of the name "introspection," just as that dim sense of an environing world which is marginally present as we converse and think, suffer and enjoy, is not deserving of the name "perception." But this usual vagueness of our consciousness of ourselves should not lead us to think of the Self as something in itself vague, or unsubstantial, any more than the frequent vagueness of our

awareness of the scene about us should lead us to think of it as being a phantasm or spiritual realm. The vagueness is not in the reality known, but results from the slightness and multitude of the reactions of the organism. In both cases attention can analyse, bring out detail, and reveal the main outlines of the reality cognized.

When thus focused and analysed, the life of the Self falls into two main divisions, the receiving of sensory impressions, and the behavior, immediate and eventual, engendered by these sensory events. I see, hear, smell; I plan, desire, act. These two functions, receptive and reactive, are actually inseparable; our sensori-motor life proceeds in rapidly successive circles—impression, action, further impression, further action. Sensation always tends to evoke action and action to yield further sensations. But the psychologist, for purposes of detailed study of the life of the mind, properly discriminates between these two main functions.

When new impressions are received from the environing world, they are usually referred to that world, and the sense in which they reveal the nature of our inner being is overlooked. Yet even when we are perceiving physical things we are to some extent clothing them in the garments of our own being, just as when, in looking through blue glasses, we see the blueness in the landscape itself, and not in the glasses. The psychologist may learn much of the Self by adopting the introspective attitude

toward these sensations which in ordinary life are instinctively localized outside the Self.

The plain man, however, is far more apt to refer to himself the kinesthetic and organic sensations already referred to. The vivid sensations that usually dominate his mental life are always received into such a matrix of steadier, more persistent elements, whose presence gives a continuity and yields a sense of permanence to his mental life that would be lacking if it consisted only of the vivid and changing projected sensations in the foreground of attention. These background-elements are, for the most part, individually faint, but form a massive whole which constitutes a considerable part of his sense of himself. William James pointed out the importance in this connection of the sensations of the incoming and outgoing breath, the beating of the heart, eyeball and eyelid movements, forehead tensions, and the like. To these we must add the multitudinous kinesthetic and visceral sensations which are not analysable into their components but add emotional and affective tone to our experience. And the continual sight of the body gives a sort of visual evidence of the continuity of one's life.

Still more important, perhaps, for our sense of ourselves, is the other side of our nature, the active, "conative" side. We are aware of ourselves as choosing, planning, desiring, willing. Just as the resistance that physical things offer to our desires and efforts makes them seem objectively real to us, so the sense of effort and striving gives us a strong

sense of our own reality. We feel ourselves to be not only perceivers and sufferers, but agents; and in proportion as a man has a strongly aggressive nature is he conscious of himself. Or rather in proportion as this tendency to self-expression is inhibited by inner and outer obstacles, so that his efforts require his attention. Conflict enhances mental life. And it is this vivid, effortful mental life, surging back and forth, pushing toward action and being checked by resistance, that makes a man contrast himself, the possessor of these vigorous impulses and the agent of these efforts, with the impressions that assail him from without and the physical things toward which he directs his action.

The Self, then, is the existent that knows and the existent that is known in self-knowledge. It is not a simple, unanalysable existent, but the complex organism, which receives impressions, manipulates them in the brain, and uses the resulting complex of cerebral elements as cues for its action. The Self in the widest sense is the whole body, with its marvellously integrated mechanism that enables it to act as a unit, to adapt itself to its environment, and, in turn, to stamp the impress of its nature upon that environment. The core of the Self is the Mind, with its co-ordinated processes that are the direct basis of our conscious life.

The Self is not an abstract Knower or Actor, not a mere principle of unity or transcendence, it is a concrete and complex existent with its own particu-

lar individuality; and this connotation of individuality, or personality, is a part of the meaning of the term "Self." Every organism acts in a manner determined not merely by the sense-impressions it receives, but also by its own individual nature. The most complex and delicately adjusted type of organism, the human being, often acts in a way far more obviously determined by its own nature than by any outer influences. And individual men and women differ so widely in the exquisite adjustments of their sensori-motor structure that their conduct under identical outward circumstances is often strikingly different. Only a very small fraction of this structure can, at present, be studied by an outside observer; and introspection can tell its possessor little about it. We really know very little about ourselves. But all the potentialities of our conduct under different conditions are latent in the structure of our bodies and brains. It is the sum of these potentialities that constitutes our personality. And to say that we have personality is to say that we are Persons or Selves.

Personality derives, in the first instance, from heredity. We are all born with a set of highly complicated congenital tendencies, out of which ripen the various instincts which are the nuclei around which all our latent motor tendencies gather. Then accumulating experience bends and develops, or inhibits, these instincts, until we come to have the temperament, the ideals, the purposes, the character, that, together with the impact of outer forces, de-

termine all our mature acts. Our brain-connections develop in this way and that, resistances are lowered here and heightened there, we form mental ruts. Our cerebral currents, flowing along these complicated channels, awaken certain movement-systems and inhibit others. The plastic child forms habits, gets set in its ways, becomes a developed Self.

This gradually developed sensori-motor structure contains that accumulating impress of the life-history of the organism which is the basis of memory. The power of memory is a significant aspect of the Self. We have no knowledge of any mechanism outside of animal bodies that is capable of engendering this peculiar form of experience that we call "memory." That is one reason among many why we can not call any other things except animal organisms Selves. If we were to wake up, as some men have done, unable to tap the memory of our life up to that moment, we should, in a significant sense, have lost our Selves.

Yet, though bewildered, and unable to plan consciously on the basis of past experience, the momentum of habit would doubtless carry us on; and if we had the same instincts and ideas, we should still, in a fundamental sense, *be* ourselves, though we should not know it. On the other hand, when a man, though preserving all his powers of memory, becomes, through a dramatic conversion, or accident, profoundly altered in his habits and desires, he becomes, in so far, a new person. Conscious of the change in his temperament or character, he *feels*

himself to be a new person, as when the Apostle wrote, "Not I, but Christ liveth in me." Of these two aspects of our being, our stock of memories and our motor tendencies, the latter are the more significant expression of the Self.

The Mind, as we saw, has a marked degree of (though not a complete) functional unity. But the Mind is embedded in the Body; and the unity of the Mind is a part of a larger unity, that of the organism as a whole, with its integrative nervous system. The Mind constantly interacts with other parts of the Body; indeed, its life consists in receiving messages through the afferent nerves and sending messages out through the efferent nerves. The behavior thus guided expresses the nature of the Self in its world. In so far as there is mental dissociation, minor movement-systems arise, which may be expressive of only a part of the Self. In the cases of multiple personality, the more inclusive Self is the truest Self; the other Selves are but partial, one-sided expressions of the nature of the Mind and organisms. These cases present no difficulty on our theory. But they are difficult to reconcile with the views which make the Self something separate from the organism.

On our view, then, a Self is a developed organism containing an integrated nervous system, of which the cerebral structure is the dominating feature. This sensori-motor system is so intricate, so delicate, so developable by use, so responsive to the influences that play upon it, that it becomes increasingly dif-

ferentiated in nature, as it functions, from other roughly similar systems in other roughly similar bodies. Each Self comes more and more to have its particular individuality. So, to account for this sense of individual personality that each of us has, we do not need to postulate a special inmaterial Soul; we have only to study in detail the congenital structure and tendencies with which we began our several careers, and the life-history of our several organisms, which has gradually shaped that structure and those tendencies into the Selves that we now are.

In all this we are taking for granted what we have said about the psychic nature of existence. Because physical events are psychic in their inner nature, our co-ordinated receptive and reactive processes are not merely cognitive processes in a materialistic, behavioristic sense, they are *conscious* processes. The peculiar, individual nature of each Self is not merely observable as a certain definite physical structure, embodying certain definite tendencies and habits. The Self can to some extent observe its own nature; it knows that its being is aglow; its reality is the sort of reality that we call *feeling* or *sentience*. But so far as the mere fact of sentience goes, we are all alike; what differentiates us is the peculiar *pattern* of each person's sentience, and its potential expression in behavior. The conception of the Self as a mass of sentience is true, so far as it goes. But the conception of the Self as consisting in specific tendencies to behavior—or in the vital

push that realizes those tendencies—is a more practically useful conception. It is a case where our duty is to express one side of the truth and not to leave the other side unexpressed. Certainly it is true—and unless it were true nothing else would matter—that we are conscious beings. But, that granted, the important thing is to discover precisely what sort of beings we are, in concrete detail; and that is to discover, so far as we can, how we tend to behave in the various situations in which circumstances may place us. For only as we know that can we know how to educate ourselves so as to make life more worth the living.

CHAPTER XVIII

THE SELF AS AGENT

The protest is sure to be raised by some readers that our conception of the Self, which identifies it with the psycho-physical organism, omits mention of its most distinctive attributes. They will say that the Self (or the Mind) works teleologically, while the body and brain work mechanically; that intelligent behavior involves determination by the end to be attained, rather than by the push from behind, so to speak, of ordinary causation; that the Self is not a mere part of nature, but in some degree above nature, an active agent not wholly subject to natural law but able to interfere with it in its own peculiar way.

There are two motives currently blended in such protests as these, which it is desirable to analyse out and discuss separately. One is the repugnance to a "block universe," the desire to feel free from the "chains of causation," the inexorable "reign of natural law." The other is the feeling that there is something more to the Self than an organic structure whose substance is the same as that of the rest of nature and whose life is a mere series of natural events. Either of these protests might be well founded without the validity of the other. We might be an integral part of nature, with no new factor—

Entelechy, Soul, or whatever—interpolating itself, and yet the psycho-physical events that make up our life might not be entirely a tissue of uniformities describable in terms of "natural law." On the other hand, there might be, at the core of our being, something properly labelled Soul, or Vital Principle, some entity not describable in terms of physiological psychology, and yet this Soul might act in ways as regular, as describable in terms of "law," as anything else in the world.

As a matter of fact, however, no Soul or Vital Principle or Entelechy or Ego, no entity "behind" the introspectable events of our mental life, has ever been discovered. Perhaps, if such an entity exists, it never could be discovered, in the very nature of the case. So the belief in such an entity is either purely *a priori,* or traditional, or it rests upon the supposed discovery that the Self acts in ways not describable in terms of natural law and thus requires the postulate of a non-natural factor to account for its behavior. This is not a logical argument. As we have just said, irregularity in behavior, or behavior of a sort not found elsewhere in nature, does not necessarily imply the existence of a Soul, or any such immaterial entity, to account for it. It is not proved that the ordinary material of which the whole world is made may not act in unusual ways when it gets into the peculiar arrangement of a living organism with a sensori-motor system. Still, bearing this in mind, it is important to see whether there really is good evidence for the

fact of this radically different sort of behavior, indeterminate, incapable of formulation into law, on the part of organic beings—or perhaps on the part of the human organism alone.

We might waive the discussion of the "vitalistic" arguments, with the remark that the fact of this irregular sort of behavior, if it can be proved, will not seriously affect the conclusions which we have reached. Every one must agree that mental processes display *for the most part* that relation of cause and effect which we find in all natural processes. In so far as the mind (or brain) *does* act "in accordance with natural law," as the phrase is, our account of it may be accepted by the vitalists. On the other hand, we are as ready as any students of the subject to accept the existence of a non-causal type of behavior, if its existence can be rendered plausible. Accepting the existence of a Soul or Vital Principle would not add to our knowledge, except as to the mere fact of its existence; it would simply introduce an indeterminate variable into our science of mind. We should have to acknowledge that there is more to the situation than science can cope with, an intruding and (from the point of view of exact knowledge) disturbing factor. But—if our arguments are sound—our realism would still stand, our belief in the psychic nature of substance, our analysis of the nature of perception, memory, and the other functions of conscious life. All our actual knowledge of our mental life must be got by such detailed studies. The introduction of this other

factor would upset none of these studies, it would simply interpolate an unknown quantity, an x, into our equations, and in so far prevent psychology and brain-physiology from ever becoming exact sciences.

It is difficult to determine the value of the evidence offered for the existence of such a disturbing factor. Certainly we can not prove that mental events (or that brain-events) are always the exact effects of preceding causes. We can not prove that such is the case anywhere in nature, except in the very limited regions where exact observations can be made. So far as we now know, there may be other substances in our world then science reveals, and other modes of action than such as are describable in terms of natural law. The ether, about which we know little, may have, for all we know, a complex life of its own, which we have at present no means of discovering. These etherial events may interact with our psycho-neural events, in ways not even theoretically reducible to law; or the laws of these interactions may be such as to seem pure caprice to us because of our ignorance. Possibly the facts which "telepathy" is invoked to explain, and the facts studied under the caption of "psychic phenomena," may eventually find explanation (if they are neither fraudulent nor explicable in terms of the laws of matter) in the laws, or caprices, of etherial life. But it would be dishonest to give the impression that any speculations as to the nature or methods of operation of these supposed immaterial

factors are at present anything more than guesses, or that they have as yet any value in explaining the observed phenomena of mental life.

It is true, of course, that animal movements are to a considerable degree unpredictable. But this is, in any case, inevitable. Organic bodies are extraordinarily complex and delicately adjusted; no two, probably, are exactly alike, at least among the higher forms. The wonder is rather that we have discovered any "laws" at all, than that we can not reduce the whole extent of animal behavior to law. It is true, too, that the development of organic life implies the development of new forms of behavior, not found among inorganic bodies. But that is necessarily the case whenever existing entities become integrated into new complexes.

The familiar vitalistic arguments are to the effect that in animal behavior various ends may be attained from some one type of situation; and that, conversely, some one definite end may be attained although the causes brought to bear upon the organism are different; and that these facts are inexplicable in terms of natural law. Very simple answers can be given to these arguments. We can point out, in the former case, that though the situations may be apparently similar, no two situations are exactly alike; that the difference in the situations *may* be just enough to account for the different behavior of the animal. Where the same animal is repeatedly put into the "same" situation, it is evident that the accumulating experience of the animal makes *his*

part of each situation different each time, and it is only natural to expect him to act differently each time. Other animals, even of the same species, may have minds different enough, or sufficiently different former experience, to exhibit different reactions. In answer to the second argument, we can point out that various non-organic mechanisms attain the same ends under varying circumstances, as, for example, a spinning top, that rights itself however it is pushed, or a self-regulating clock, that keeps correct time in spite of variations in the influences affecting it.

A *purpose* is analogous, evidently, to such a self-righting mechanism. Whatever indeterminate factor may conceivably enter in, a purpose is, describably, a "set" of the organism, a tendency towards a certain sort and amount of motor expression, which persists through varying circumstances until that motor expression has been accomplished—or until that particular set of the organism is crowded out of existence by other tendencies.

Certainly purpose, desire, will are efficacious, and important. The conduct of organisms is not wholly determined by the sense-impressions that rain in upon them. They react according to their nature. And the larger part of the nature of a human being is expressible in terms of his purposes, desires, ideals, and disposition. But these need not be supposed to control the future magically, in non-causal ways; they control it, evidently, by being forces in the causal nexus. Teleological language is often

convenient. But the future has no power to produce events; it is not yet existent. Our *anticipation* of the future may have such power; but such anticipation consists, existentially speaking, of a sensori-motor complex, which can operate in the manner of ordinary causation. The mind is a complex of forces, one state of its being causing the next, causing events in other parts of the body, and indirectly, in the outer world. Whether any supernatural factors disturb this process of causal interactions is a legitimate matter for inquiry. But in any case, it is clearly, *in general,* a set of natural processes. And these processes are so intricate that, even when the causal connections are not clear, we should be wary of saying that the ensuing results can not be accounted for by the natural causes at work.

It is true that living cells must be enormously intricate to contain a sufficient number of factors to determine according to natural laws the growth of the body, its specific characteristics and its tendencies to specific behavior. But living cells *are* enormously intricate; the number of electrons and protons they contain is unimaginable. Each cell is an intricately arranged universe in itself. And nobody knows how far down this complexity may extend. Each proton and electron may be, for all we know, a whole complex world. We are very far from being able to analyze the life of a single cell. So all the conclusions of the vitalists seem, at least, premature. Give us time to untangle this maze of

events before pronouncing that the resultant gross behavior of the organism is not, ultimately, explicable in terms of myriads of law-abiding events. The conception of the world as a homogeneous whole, whose life is describable, theoretically, in terms of the uniform sequences of its component parts, has had astonishing success; it has, therefore, an immense presumption in its favor, and should not lightly be abandoned, even in our study of ourselves. The vitalists have called attention to some forms of animal behavior which we are far from being able to explain "mechanically." But they are equally far from being able to prove that they are *not,* ultimately, explicable in "mechanical" terms. And since their postulated intruding factor remains mysterious in nature and method of acting, since it is not actually discovered, but only postulated, and since the postulation of it adds nothing but a new perplexity to the situation, we may well, while remaining open-minded, say "not proven," and continue our attempts to discover in our field further causal laws.

If we *have* Souls, in the vitalistic sense, they do not seem to play a great rôle—except as a comfort to those who are weary of themselves as they describably are. We really *are* what our actions show us to be. We are also the ineffectual beating of other wishes and purposes against the inhibitions raised by our dominant habits and impulses. And a great mass of less conspicuous tendencies embodied in our nervous structure. This is the describable and

educable Self. *Intelligence,* empirically, is an organization of the sensori-motor processes in which the traces left by accumulating experience are so elaborately and justly representative of the nature of the surrounding world that they are able to steer the organism through its various dangers and predicaments into conduct that makes for its welfare and that of the other organisms about it. *Volition* may be defined as the process by which a series of mental states characterized by predominant ideational-anticipatory elements evoke, through the efferent nerves, bodily movement. *Decision* (the fiat of the will) is the resolution of opposition, the overcoming of contrary motor tendencies, so that a result hitherto blocked can now be attained. The sense of effort, which is apt to accompany such situations, is due to tentative movements and tensions (static movement-systems), which may become widespread enough to become the physical basis of emotion. All this is very personal, that is, it expresses the particular nature of the person acting. But there is nothing in it to suggest a supernatural Agent.

Certainly all animals, including ourselves, are made of the same stuff that makes up the rest of the world. It seems extremely probable that all species of animals, including ourselves, have developed—during a span of millions of years—from very primitive "organic" forms, which, in turn, developed out of "inorganic" forms of life. "Organic chemistry" is nowadays called the chemistry of the carbon com-

pounds; the heavy molecules found in organic bodies are merely complex aggregations of the same atoms that are found in inorganic bodies. It is, therefore, natural to suppose, *a priori,* that animal behavior, including our own, is merely a complex resultant of the behavior of these ordinary atoms in their new and peculiar situations. The contrary belief, that we must postulate a Vital Principle to effect what this extremely complex and delicately adjusted organic structure is supposed to be unable to effect, seems to derive not from any positive evidence pointing in that direction, and not merely from the desire to fill in by speculation the blanks in our present knowledge, but rather from the traditional, pre-scientific notion that we have "Souls" which are independent of our bodies, and from the sense of added dignity and comfort which that notion gives to many. Some students in this field display a zeal to discover conduct of such a sort that it can be pointed to as incapable of explanation in terms of natural cause and effect. And it is obviously true that some philosophies for the truth of which very little actual evidence is offered—like that of M. Bergson, for example—are far more popular, because of their espousal of this conception of "free will," than more soberly empirical discussions.

But there is only an arbitrary line between "the will" and other impulses. Voluntary action is simply a refinement upon reflex-action, a more delicately balanced adjustment, not a separate "fac-

ulty." Action after deliberation, when there is prevision of the end to be attained, we call voluntary. The will-impulse is obviously free to evoke action just in so far as there are no obstacles in the way sufficient to hinder it. Freedom is absence of hindrances. Free will means, empirically, freedom from slavery to mere impulsive action, to our passions, to those motor tendencies which do not most fully carry out the nature of the Self as a whole. Subject to opposing forces, all impulses are free. In so far as any impulse is checked by other impulses and ideas, it is not free. The question whether there are gaps in the causal relations in this field, whether a certain sort of impulse, which we call the "will," is exempt from the ordinary laws of cause and effect, is a legitimate question to raise. But whatever our decision as to this, there is no ground for saying that we have not, in any case, free will in the empirical sense. We do will, we do choose; and our willing, our choosing, is efficacious. We have not freedom enough from inner obstacles, probably, to shout out in church, or walk down the street naked. With respect to a whole range of acts we are not free from the inhibition of our own nature, just as with respect to another range of acts we are not free from thwarting by outer obstacles. But to a degree, certainly, our will-impulses are free to express themselves in action.

In this empirical sense, our freedom may be extended by will-training. Conscious choice, determined by the relatively permanent ideals of the

whole Self, may more and more replace passionate and impulsive action. Weak natures are the prey of outer stimuli and their own passions or caprices. Stronger men determine their conduct in greater degree by their ideals and enduring purposes. They are more independent of outward circumstances and of inner changes in mood and desire. In some men this "set" of their motor tendencies which we call their will becomes so strong as to assert itself against tremendous obstacles. To some extent this doubtless depends upon heredity. But observably it is, to a great degree, in most cases, the result of training, whether the unconscious effect of wise nurture or a religious life, or the painfully achieved result of inner struggles.

"Are we then free to do as we will?" Yes, if our will is vigorous enough to overcome whatever obstacles, outer and inner, are in the way. Whether your will *is* strong enough to overcome this or that temptation or difficulty, no one can certainly know, not even yourself. The forces are too intricate and too hidden from observation. But the more intimately we know a person, the more detailed and penetrating have been our observations of his behavior under varying circumstances, the more confidently we can make predictions concerning his future will-impulses and acts.

"But how can I be free to choose, if my actions are always subject to law?" You are not "subject" to anything! The "laws" are merely the formulation of your own nature. They express the way you

do actually choose; they describe the kind of person you are.

"But might I not have acted differently from the way I did act?" Certainly. You *would* have acted differently *if* you had wanted to. That is, if you had wanted to vigorously enough to overcome whatever impulses or passions led you to act as you did. If you acted badly, it is not enough to know that you could have acted differently, and to trust that you will act differently next time. It behooves you to take steps to strengthen the good impulses in you and inhibit the bad impulses. A little wholesome remorse may be efficacious, or the development of the practice of prayer, or church-going. Nothing is clearer than that we can not be good by simply willing to be good; we must strengthen the good tendencies in ourselves, just as we must strengthen our muscles if we would be physically strong. All moral training, all penology, all education, all legislation are based upon discovered causal relationships.

It is true that no amount of force from the outside can wholly determine a man's behavior. His conduct is determined largely by his own nature, as is that of inorganic bodies. But whereas one stone or one cupful of water is so much like another that we can be sure of how it will act under certain circumstances, men vary so from one another, and the same man varies so much from time to time, that prediction is very difficult. But a Soul or Vital Principle would not help us. No one has any means of knowing what *it* will do, or how to affect it, if it

exists. If it is, by good fortune, a factor working for good, we could be thankful; if for evil, we could be sorry. But in any case we should not know what to *do* about it. So for all practical purposes we should have to ignore it, and proceed on the basis of whatever causal connections we can discover.

We leave the question open, then, as to whether there is something more to the Self than we have described, as we leave open the question whether there is something more to nature in general. Very likely there *are* many aspects of both that are not yet known to us. But science, and scientific philosophy, proceed on the basis of what *is* known, and only accept such hypotheses as serve to explain the discovered facts. The Self, *observably,* is the sort of being we have described. It is, observably, an agent in the sense that we have defined. We have much to do in filling out the details of our empirical knowledge of ourselves and our world. If there are other factors to be reckoned with, and other aspects of being, we must wait for future investigations to disclose them. At present the tendency to explain human life in terms of vague and mysterious entities, Souls, Entelechies, and the like, seems to be confusing discussion rather than clarifying it.

CONCLUSION

CHAPTER XIX

MIND AND NATURE

Our endeavor has been to describe consciousness as a natural occurrence. Since it lay among the potentialities of matter (psychic in substance from the outset) to develop organic bodies with co-ordinated nervous and muscular systems, it *ipso facto* lay among its potentialities to exercise the function of consciousness. So far as this problem goes, there is no need of postulating a discontinuity in evolution. This is not to say, of course, that there *are* no discontinuities in evolution. We are not concerned in this volume with the attempt to describe the history of all existent entities by a single set of laws. It *may* be, for all we have said, that at various "junctures" in evolution (to use Mr. Lovejoy's term), certain portions of the existent universe begin to act in new ways not deducible from the laws which described their earlier behavior and continue to describe the behavior of the rest of the universe. It may be, indeed, that every existing entity begins, at a certain point, to behave in a radically new way. It may even be the case that additions or subtractions are made to the substance of the universe. But however this may be, the chief *argument* for the existence of discontinuities in evolution has been the appearance upon the scene

of *minds*, of *consciousness*, of *qualities*. Now our discussion, if it is sound, has shown that there is no need to postulate any discontinuity in evolution to account for these facts. And since discontinuity in evolution would be a baffling and unintelligible phenomenon, we may legitimately rejoice in clearing away what have been considered the most serious obstacles in the way of a monistic view.[1]

A mind is simply, we have said, that receptive and reactive organ whose structure is revealed by physiology as the neural mechanism of the cerebrum. Its processes, like all material processes, are psychic in their inner nature; but we have given this particular set of events the designation *mental*, to distinguish them from the innumerable events, similar in substance, which are occurring throughout the universe. For the differentia of the mental does not lie in its substance; mental states, or events, are made of just the common substance of all things. The differentia of the mental lies in the concrete relations which link this co-ordinated system of processes to the things, or events, that stimulate them, and to the further bodily processes which they evoke. Psychic states which reflect the happenings of the outer world, the continually changing adjustments of the body's muscular system, and the continually changing state of the various bodily organs; which affect one another according to the laws of neural conduction,

[1] Mr. Broad holds that it is logically impossible to avoid admitting the existence of "emergent laws," in the case of secondary qualities, and "trans-physical" processes. (*The Mind, etc.*, pp. 65-81.) But he has not considered the theory unfolded in this volume.

and co-operate to control the body's movements—such an integrated and practically serviceable set of events constitutes the life of a mind, a series of mental states. In so far, there is nothing not in principle intelligible in terms of the elements and laws found elsewhere in nature.

Our theory is "materialistic" in a sense. Our minds are made of the same matter of which everything else we know about is made. But since the term "matter" is merely a name for the stuff that constitutes the "things" we are acquainted with, and since this stuff is, according to our view, "psychic" stuff and nothing else—the physical aspect being merely the pattern according to which it is arranged—the term "materialism" should have no sting. Moreover, there seems to be something more pervasive than matter, viz., the ether. We do not know what forms of etherial life there may be, and whether or not matter, and so mind, are merely aggregates, or motions, of the ether. But that would have no significance for our theory, which concerns itself with the higher complexifications of the world-substance.

Certainly we must not be dogmatic and deny the possible existence of other realities and other laws than those with which science at present deals. It is *conceivable* that there is an etherial counterpart of our material brain, as Sir Oliver Lodge has suggested, which may survive the dissolution of the material brain, and that there is a continuance of something like our present mental life, as the inner life of these continuing etherial structures. It is

conceivable that there are all sorts of forms of etherial life which are in their essential nature psychic or quasi-psychic—*i.e.*, in some degree analogous to the forms of the life of matter. The ether, and its relation to matter, is as yet a great puzzle. It behooves us to be humble. But it also behooves us to be honest, and admit that we are here in the sphere of guess-work. There is ample room for anybody's will to believe. And while no theory yet formulated can show us that individual immortality is a fact, or how it can be a fact, our theory has as much room for whatever facts may be discovered as any other.

Dualistic theorists usually assume (or their readers assume) that the immaterial Soul which they postulate is immortal. But it is sheer assumption on their part. As in many other cases, the use of a word that has popular connotations leads the reader, or the theorist himself, to conclusions which the evidence offered for the theory does not logically sustain. Even if there is evidence of the existence of an immaterial Soul interacting with the brain-processes, that evidence does not point to the immortality of such an Immaterial Entity. Why should we suppose an Immaterial Entity to be longer-lived than a Material Entity? . . . To say this is not in the least to discredit the belief in immortality. That belief is usually held on religious grounds. It is merely to point out that so far as evidence goes, no psycho-physical theory is any better off than any other. The *vaguer* the theory, the more readily this

lack of evidence can be veiled; in a fog we can believe anything to exist. But surely philosophy, like science (of which it is an extension), should stick close to evidence, to observed facts, and to such hypotheses as are best able to account for these facts. "Psychic phenomena" should, of course, be carefully studied, as well as mystical experiences, and everything else that might conceivably have bearing upon the question of the status of minds in nature. But we must admit that at present no conclusions of importance can safely be drawn from these obscure fields to add to our knowledge on this point.

In any case, whatever other forms of consciousness or quasi-consciousness or super-consciousness there may be, our describable human consciousness, here on earth, is clearly a function of the living organism. We only obscure matters when we blur that fact. We can trace the development of consciousness in the development of the cerebral mechanism and the movement-systems of organisms. Man has the most developed consciousness because he has the most developed cerebral mechanism and the most developed movement-systems. There seems to be no ground for denying that this development has been continuous. That is, it is possible to conceive in outline a continuous process of evolution which should result in the complex integrated events that we call mental life. And there is no particular reason to suppose that the process was not continuous. The main reason for believing it discontinuous was the supposed fact that mental life

can not be explained without postulating the appearance upon the scene of a radically different sort of entity or substance, immaterial and mysterious, that came no one knows whence, exists nowhere, and disturbs the body's behavior no one knows how. On our view, there is no need to believe in such an entity to explain consciousness. Consciousness was a novelty, when it appeared upon the earth; but it was no more a novelty than all complexifications of the structure and motions of reality. It was not an inexplicable novelty. The nature and spatio-temporal pattern of existence being what they are, it had inevitably to appear.

If our view is correct, it is a matter of arbitrary definition to draw a line and say when mental life began, or when the function of consciousness began to be exercised. Just so it is not possible except by arbitrary definition to say when man's ancestors became men rather than non-human animals, to say when forepaws became hands, when neural nuclei became brains. Animals developed mental life and became conscious as gradually as they developed their various structural features and habits—by what steps, in detail, we only partially know.

So it is a matter of arbitrary definition to say at just what instant a man awaking from dreamless sleep becomes conscious. Suppose he is awakened by an alarm-clock. Shall we call him conscious when the sensory events produced by the air-waves and afferent impulses take place in the auditory area of his cerebrum? Or when a motor response of some

sort is initiated by those sensory events? Or when the movements produced send nerve-currents to the cerebrum and excite kinesthetic sensory events there? Or when the two sets of sensory events become "associated," and awaken further sensory events ("images"), so that the idea "my alarm clock going off" more or less clearly formulates itself? The existential situation consists of a rapid series of events such as has been roughly indicated. According to our definition, it is when the organism, incited by a group of its mental states, adjusts itself, however vaguely, to something or other, that we call it conscious. But this is a matter of definition, not of ultimate importance. The prior stage, the mere possession by the organism of sensory events in the auditory area of the cerebrum, before the body has used these states as cues, would certainly not be a stage of consciousness of anything. As soon as the first cerebral arc has been completed and has caused some motor adjustment—as soon as the sound of the alarm-clock has caused some muscles to twitch—the organism is taking cognizance of the sound, and we may say that the man is conscious of it. But it is true that if the process were to end there, the man would never know anything about the sound, would not remember it or describe it, in fact would deny having heard it. It is only as the further processes described above occur that the man *knows* he has heard a sound, that this experience has been added to his stock of accumulating and rememberable experiences. So that

if any one prefers to deny that he is conscious of the sound until some or all of the further processes take place, there should be no serious objection. The only important thing is to understand the existential situation, in exact detail.

In any case it is not correct to say that the minute events which make up the life of the mind are conscious, or that the whole group of them that may be simultaneously co-existent is conscious. It is only the organism, or Self, that can be said to be conscious. Even the simplest forms of consciousness involve the co-operation of numerous organic processes. And any forms of consciousness that are to be revivable in memory, and discoursed about, involve still further complications. The mental events must be co-ordinated with the main stream of mental life. Dissociation means that the dissociated mental events yield no memories that can be integrated with the mainstream of memories; these events, therefore, are unknown to the Self. This lack of means of information concerning these phases of the mental life of our own organism may be unfortunate; we may fail to bring to bear upon our conduct some useful experience or desire or idea that has been produced in us but not properly associated. These are non-voting citizens, so to speak, of our mental world. But, on the other hand, our minds are thus cleared of much useless information. It is well that we can walk without noticing the thin stream of sensori-motor life that controls the walking. By leaving a part of our sensori-motor machin-

ery to take care of routine activities, we leave the main body of our mental life free to deal with the more novel, perplexing, or interesting situations.

In general, then, vigorous and integrated mental life, that will be revivable in memory, is evoked when the organism is confronted by new or uncertain or emotionally stimulating situations. Instead of the smooth evocation of a well-learned movement-system, action is temporarily blocked, energy accumulates, the psycho-neural events acquire more volume and vigor, until the accumulated energy breaks a path through. The importance of the synapses seems to be twofold: by their relative resistance they determine the direction of the discharge, and by their absolute resistance the amount of mental activity that must be awakened before discharge takes place. It is this damming up of energy that makes vigorous mental life, and this direction given to the currents that determines its practical success in steering the organism. But it is a mistake to suppose that mental life exists primarily or solely *at* the synapses. They are simply places of resistance to the passage of the cerebral currents; it is the whole integrated complex of psycho-neural events that constitutes our mental life.

We can thus describe what we may call the curve of consciousness as follows. First, slight sensory excitations may produce slight, tentative motor responses, but no visible movements, as when we wake from sleep, and as yet, before our eyes are open, are but vaguely aware of a world about us, or

of our body. Nothing is as yet attended to, no conscious experience is being produced that will be remembered and form a permanent part of our experience. Then attention may be evoked; *i.e.*, some sense-organ is adjusted, and changes in breathing, etc., take place. The sensory events become more vigorous, and evoke wider associations and more vigorous reactions. We now have memorable consciousness. Then the proper course of action, or bodily attitude, may become uncertain; there is no smooth, ready-prepared outlet for the discharge of the cerebral currents. Bodily tension increases, energy accumulates, new centers are aroused by association, until the convergence of forces bursts its way through in some direction and arouses some movement-system. At such moments consciousness is broadest and most vivid. But at subsequent repetitions of the situation, the way having been paved, a smoother transition is possible, less energy is required, fewer associations need be called up, and consciousness may become narrower and less vivid. As bodily adjustments become more and more habitual, the kinesthetic sensations from each phase of the movement system tend to excite the appropriate succeeding movements without arousing any other sensory elements. This circular sensori-motor process may become so thin that another, fuller set of sensori-motor processes can go on simultaneously without interfering with it. The "automatic" successive sensori-motor processes are now outside the main current, and are unknown to

the dominant life of the organism. We then say, probably, that that activity went on unconsciously.

It is not merely novel or perplexing situations that excite vigorous mental life. Dangers and needs —such as hunger, thirst, and sexual desire—evoke bodily excitement and intense mental life, even if the situation is often repeated. And this is true to a degree of anything that *interests* us. An interest, although always rooted in some instinct, may not point to anything of importance to the survival of the organism; it may be, rather, a later development of what was originally of practical importance to the race. We need not fear, then, that vigorous mental life will disappear if men become able, some day, to make smooth and habitual all the mechanisms that have to do with the satisfaction of their bodily needs and desires. This would but leave their minds freer to carry on their activity in directing play, in esthetic and religious contemplation, and the study of the world in which they live. For mind is not only a mechanism ensuring the survival, for a time, of the body of which it is an organic part; in becoming that, it has become also an organ whose activity may be desirable because of the forms of happy consciousness that it engenders. Consciousness, developed in the cosmic process, like the functions of digestion or respiration, because of its instrumental value, is itself the finest flower of evolution, the only thing in the world that has intrinsic worth.

Is this view "mechanistic"? Not *necessarily,* in

the narrow sense. The brain obviously *is* a mechanism. But, for all we know, there may be some free play in its action. The investigation of this problem lies, like that of the problem of continuous *versus* discontinuous evolution, beyond the scope of this volume. It is conceivable that the formulation of the laws of mental life should require the introduction at points of independent variables. The fact that "mental life" is seen to be the same set of events that, known through perceptual channels, we should call the neural activities of the cerebrum, does not close the question. In any case it is the cerebral processes whose regularity or irregularity is in question; and if they do seem, on careful study, to be hopelessly irregular in spots, we can use the term "vital principle," or anything else you please, to point to the irregularities. They will not be thereby *explained,* but they will be labelled. *Nothing* will explain irregularity; for explanation consists precisely in reducing to order, in describing an event as a case of some "law." But if irregularities, inexplicabilities, there are in the end, after all our arranging and pigeonholing, we must make the best of the case. We can not know in advance that the world is intelligible throughout. And the fact that the theory here defended clears up some of the most puzzling mysteries does not necessarily imply that everything can be reduced to a single, simple clear-cut scheme. It merely, by so much, clears the way toward such an eventual consummation, if the nature of things makes it possible.

As a matter of fact, we are obviously not yet in a position to observe whether our cerebral life is entirely a tissue of uniformities or not; nor can we tell by introspection whether this life (now called our "mental" life) is entirely a tissue of uniformities. The matter is decided by presumption and prejudice. It is only as we can discover uniformities and formulate laws that we can understand and control anything. Those who love simplicity and intelligibility and control will believe that natural law "reigns" everywhere. Those who chafe under the conception of this "block universe" will believe in some exemption from causal laws, at least with respect to the mental life of human beings. Our theory, which finds no need of assuming a special mental or psychic stuff, may be called an existential monism by contrast with the traditional dualism of mind and matter. But of course it does not presume to judge whether all the matter of which the universe is composed is of one sort, or not; that is for science to discover. So it is for science to determine whether one set of laws is or is not capable of describing all the events that make up the life of the universe. The motive for hoping that there are irregular events in our cerebral life will perhaps be lessened for those who accept a theory like ours, which makes not only will-events but every mental event causally efficacious. But this matter, like all others, should not be settled by our hopes or desires; it should be left unclouded by emotional

bias, or partisanship, to be decided by such evidence as can be obtained.

However, the pleas that one comes across for belief in a partially indeterminate universe are apt to be harmful, in that they may turn students away from the endeavor to find relations of cause and effect. For it is, of course, only as regularity exists that we can hope to understand nature, master it, and turn it to our uses. If there were no exact uniformities in nature there could be no science, nothing but approximate, undependable knowledge. Events usually take place in such and such ways, we should say, but should be unable to predict when they would not happen in that way. It might, conceivably, have been that sort of world. Things might have been so heterogeneous in substance as to be incommensurable and unclassifiable. Every separate element might have been an utterly different sort of existent, alien to every other. Nature might have been so wholly in flux as to change its ways over night. Or, at least, it might have acted so irresponsibly as to make all calculation and all science impossible. Such a state of things would be baffling. And where we have not yet been able to discover uniformities we *are* baffled. This is particularly true of the field of our mental life. We are in dire need of understanding other people and our own selves far better than we do. However, it is fortunately true, in this field as in every other, that the more we study the facts concretely, the more we discover relations of cause and effect. It would seem wise, then, to push

investigation as far as possible along these lines, before we abandon the hypothesis that the study of nature and of ourselves can be made, without reservation, into a science.

There is, nevertheless, a widespread popular aversion to any theory that makes the Self an integral part of nature, made of the same substance, and following the same laws. To think of the world, and especially those parts of it which are ourselves, as being a web of minute uniformities seems to many to petrify this throbbing universe, and take the spontaneity out of our lives.

But we must remember that the fact of universal law, if it is true, is only one fact about the world, and not a description of it in its concrete reality. The world is alive and pulsing, its "mechanism" is only a meager abstraction from it. There are no "chains of causation." Everything lives according to its own habits; if all existing entities act in uniform ways, it is doubtless because it is their nature so to do. If, then, we discover, what for long men did not suspect, that there is, underneath the wonderful variety of nature, a no less wonderful regularity, this should not diminish our interest in nature, but increase it. A cosmos is far more interesting than a chaos, law than caprice.

There will still be mystery enough left, Heaven knows. Why there is such a thing as causation, for that matter why there is a universe at all, and why it is this kind of a universe, it is quite beyond our powers to learn. Life, consciousness, nature as a

whole, with its inconceivably complex character and history, constitute an inexhaustible romance. And surely this mysterious regularity, this unfailing precision, this marvellous exactness is one of the most romantic facts about nature; it is particularly romantic in ourselves. To unravel the maze, to comprehend the network of causes, to discern the framework beneath the structure is a luring task for our spirits. Each individual thing and person is unique, the circumstances of today are never quite what they were yesterday, the same combinations never quite recur; and so history never repeats itself in the large. But in its minute structure history repeats itself over and over again; and to a keen enough analysis perhaps even its most confused phases would fall into order. So the world is not merely to gape at, but to comprehend; it is baffling, but shot through with sudden clues. It lies before us, perhaps ultimately comprehensible, but requiring the effort of ages to understand.

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